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"LOANS TO BROKERS AND DEALERS FOR ACCOUNT OF OTHERS"

"LOANS to brokers and dealers for account of others" on the weekly statement of the reporting member banks of the New York Federal Reserve Bank has become the focal point of money-market interest. The purpose of this article is to analyze this item in its relation to the money, credit, and price situation. The origin of the funds in the "loans for others" has been repeatedly pointed out, and only a brief summary of the source of these funds seems necessary. It has generally been accepted that the lenders in the account of "others" are corporations, individuals, and foreign creditors. The last named, of course, may include corporations, individuals, and banks. The amount of the items credited to each of the representative divisions of the lenders is not known and for the general purpose of this analysis is not important. It would be very much worth while, however, if the amount of foreign money in the account of "others" which may be withdrawn from the country at a time agreeable to the lenders could be definitely known. It would also be valuable economic information to know exactly how far the corporation lending in the stock market is a factor in providing a market for the new capital issues of the corporations themselves. But these are unknown facts and the item of "loans for account of others" will for most of this discussion be considered as a whole.

SOURCE OF FUNDS OF "OTHERS"

For the domestic funds of "others" the source is the same as that of the superabundance of money and credit for almost any conceivable business purpose for the last six years. Except for the net loss of $134,367,000 gold in 1925, the tide of gold movements had been toward the United States from August, 1920, to April, 1927. From April, 1927, to June, 1928, the net loss of gold from the Federal Reserve System was about $500,000,000, and during the last half of 1928 the gold movements just about hung in the balance with a small gain for the United States. But from August, 1920, to April, 1927, the monetary gold stock of the United States increased from $2,850,640,000 to $4,610,000,000.[1]

This huge inflow of gold resulting from favorable trade and debt relations growing out of the war furnished the basis for the unprecedented expansion in bank credit. Dr. B. M. Anderson, Jr., has pointed out that between June 30, 1922, and April 11, 1928, bank loans and investments increased $14,511,000,000, and deposits $13,544,000,000. For the last five months of 1927 bank loans and investments expanded $3,361,000,000, and deposits $3,117,000,000.[2]

The banks, after accumulating unwieldy excess reserves by gold imports, sought to increase their earning assets by increasing loans and investments. This made it easy for any kind of an instalment selling scheme to get financial support. Corporations increased their capital at low rates of interest. The hand-to-mouth merchandising policy which grew out of the depression of 1921 economized on the amount of money required to carry on the increasing volume of business. As a result the profits and surplus funds of corporations and individuals have increased more rapidly than ever before recorded. In a survey of 106 corporations, July 30, 1928, Stone, Webster, and Blodget found that notes payable had been reduced about one-half as compared with December 31, 1921. Many of the leading industries, includ-

[1] *Annual Report of the Federal Reserve Board*, 1927, p. 77.

[2] *Chase Economic Bulletin*, October 11, 1928. Also see *Chase Economic Bulletin*, June 4 and June 25, 1928.

ing railway equipment, industrial chemicals, electrical equipment, fertilizers, apparel, and automobiles, had in the six years eliminated notes payable entirely. The 40 corporations furnishing complete information showed an increase in sales volume of 70 per cent, with an increase of only 26 per cent in inventory. Many of these corporations, which had in past years depended on the banks and the commercial credit market to finance their annual trade, were lending in the money market, according to the findings of this report. The year 1927 was reported as one of the most profitable years for industry in history, and the National Bank of Commerce of New York finds that 229 corporations reporting for the first nine months of 1928 show a net profit of 21 per cent over 1927, and 218 corporations report for the third quarter an increase of 38 per cent in profits over the third quarter of the preceding year.[3]

To draw a brief conclusion from this evidence, it seems that the inflow of gold resulting from post-war conditions favorable to the United States and the easy-money policy adopted by the banks made available to the corporations and the public a flood of funds at low rates for production, expansion, and consumption, and the results have been large corporate and individual profits, creating surplus funds for lending by corporations and individuals. The corporations took advantage of this excess of money and credit to float new capital issues and refund outstanding securities at lower rates, which enabled them to pay off their bank debts, reduce capital costs, and exchange long-term debts and stock issues for current funds.

THE PLACE OF "LOANS FOR THE ACCOUNT OF OTHERS" IN THE CREDIT SYSTEM

The source of the funds of corporations and individuals making up the "loans for the account of others" has been the subject of much statistical discussion and seems very well understood. But the economic relations of this item in the credit system are still vague. The loans to brokers and dealers on demand secured by stocks and bonds, as reported by the Federal Reserve Bank

[3] *Commerce Monthly*, X, No. 8, 29.

of New York, exceed all previous records. In January, 1927, the Reserve Bank's report showed a total of $2,778,000,000 brokers' loans, of which $741,000,000 were for the account of "others." The report of January 4, 1928, showed a total of $3,810,023,000, of which $927,000,000 were for the account of "others." For January 2, 1929, the total loans were $5,330,103,000, of which $2,166,066,000 were for the account of "others," and this is a decline in the loans for "others" of more than $156,000,000 from the peak of the previous week.

Table I compares the three classes of lenders for the first report in each month since January 4, 1928.

TABLE I

COMPARISON OF FIRST REPORT IN EACH MONTH SINCE JANUARY 4, 1928, OF THREE CLASSES OF LENDERS

(000 omitted)

	Own Account	Banks Out-of-Town	Others	Total
Jan. 2, 1929....	$1,516,049	$1,647,988	$2,166,066	$5,330,103
Dec. 26, 1928...	1,109,301	1,659,899	2,322,227	5,091,427
Jan. 4, 1928....	1,511,177	1,371,213	927,633	3,810,023
Feb. 1.....	1,267,004	1,496,999	1,051,817	3,815,820
Mar. 7.....	1,019,403	1,461,437	1,214,869	3,695,709
Apr. 4.....	1,264,718	1,499,806	1,412,784	3,979,308
May 2.....	1,329,247	1,586,152	1,366,258	4,281,657
June 6.....	1,166,619	1,641,701	1,754,920	4,563,240
July 3.....	1,131,568	1,511,506	1,664,002	4,307,076
Aug. 1.....	928,466	1,498,299	1,832,631	4,259,396
Sept. 5.....	906,779	1,521,723	1,860,707	4,289,209
Oct. 3.....	929,901	1,682,057	1,958,020	4,569,978
Nov. 7.....	1,064,398	1,726,406	2,188,164	4,978,968
Dec. 5.....	1,271,405	1,837,905	2,285,280	5,394,590

* The weekly statement of the Federal Reserve Bank of New York.

From these facts it will be observed that the large increase in the demand loans made to brokers during 1928 was for the account of "others." In fact, the loans made by New York City banks for their own account decreased during the year and the loans for the account of out-of-town banks showed only a small increase of less than three hundred million.

It seems evident from the statistical records that the "loans for the account of others" furnished the funds for the spectacular speculative market of 1928. Some of the questions which

seem to be in need of answering about these loans are: Did these funds come out of industry? Did they come out of savings accounts? Have credits for commerce been restricted as a result? Have the loans for "others" affected the rates for money in business and on the call-money market? What are the relations of these loans to the bank accounts, bank reserves, and the total volume of credit? Why have the corporations lent their funds on call instead of investing them? What would have been the situation if the funds had been left in the banks for the banks to lend as they saw fit? Why have these loans been made on demand and not time? How, when, and in what manner will these loans be reduced, and what will be the consequences for the securities markets, the banks, and general business?

"LOANS FOR OTHERS" AND INDUSTRY

When a loan is made to a broker, no matter who makes the loan or who the broker is, the funds are used to pay for collateral for the account of a borrower, and the seller of the collateral either deposits the funds in the bank, pays current debts, or buys other securities or property. If the funds are left on deposit in the bank, the wise banker will soon put them to work by lending these funds to some other buyer of securities, broker, or business man, or he will invest these funds for the account of the bank in commercial paper or bonds. Regardless of the source of the funds or the borrower, the funds flow directly back into business. Funds invested in new security issues for the purpose of building new businesses or increasing old ones are for business expansion. Funds lent to carry old securities on margin become cash in the hands of the sellers of these securities, and unless these funds are hoarded in the form of cash they flow into other securities, new or old, or into business through the direct outlay of the sellers of the securities or through bank loans to customers.

By any process of reasoning it seems too simple to be questioned that loans against securities are a direct stimulus to business enterprise. If there is a danger in this form of loans, it would seem to lie in the direction of encouraging overexpansion and overproduction, which cause price declines and a depreciation in

the value of the properties and securities resulting from the loans themselves. It is quite possible that such a depreciation of values could be carried to the point where the properties built by loans could not be sold for enough to pay the debts when due. This has happened in past industrial and financial history, and has usually been characterized as a business crisis resulting from an overexpansion of capital and overproduction of goods.

"LOANS FOR OTHERS" AND SAVINGS ACCOUNTS

There is little evidence that the loans by others or the speculative craze has cut into savings accounts. The Comptroller of Currency in his annual report for the last fiscal year, ending June 30, 1928, states that savings deposits in banks had reached the total of $28,132,575,000, or $214.33 per capita, on the basis of 131,320,000 population, as compared with $26,032,001,000, or $200.55 per capita, on the basis of 129,804,000 of population at the close of the preceding year.

These are the deposits not subject to check upon which interest is paid at regular intervals by savings banks or other banks which handle such accounts.

The report on savings deposits represents returns from some 26,000 banks, including all savings in national banks, numbering 7,676, and those in other institutions which make such information available for the use of the Comptroller. The report does not pretend, however, to include total savings in all institutions in the country.

While satisfactory statistics on savings since June 30 are not available, there is enough published evidence to indicate that 1928 will be a record year for savings accounts.

Other forms of savings, such as new insurance bought, investments by workers, and new homes built, have made record increases during the last two years, according to all available information.

From these evidences of savings the loans on stock-exchange collateral have not impaired the public's savings accounts. On the contrary, the rates of increase in savings seem to have broken records in proportion to those of brokers loans.

"LOANS FOR OTHERS" AND COMMERCIAL CREDITS

The statement of the 624 reporting member banks as of January 2, 1929, showed that "all other loans and discounts," representing for the most part the financing of commerce, stood at $570,979,000 above the corresponding week at the end of 1927. Whether this increase in commercial financing is equal to the increase in volume of business and the increase in prices cannot be determined exactly. The United States Bureau of Labor Statistics index of all commodity prices at wholesale stood at 96.7 in November, 1928, against 96.7 in November, 1927. The Federal Reserve Board's index of the total production of manufactures for the same months stood at 111 and 99, respectively, and the index of wholesale distribution in nine lines of trade at 97 against 95.

The month of November is selected because it is the last month for which complete statistics are available at the time of the writing of this article. It would seem from these comparisons that the increase of more than one-half billion in the volume of credit furnished commerce for the final months of the year as compared with the previous year fairly represented the increase in the volume of business plus the reduction in the volume of commercial paper outstanding.

The commercial paper outstanding has shown a steady decline from November, 1927, to the end of 1928, as reported by the American Acceptance Council.[4] On November 30, the commercial paper outstanding was $421,000,000, 30 per cent less than a year before;[5] but bankers' acceptances have steadily increased, reaching the volume of $1,200,000,000[6] on November 30, almost $200,000,000 more than a year before, and the highest figure in recent years.[7] Whether or not the volume of commercial paper would have been larger if the rates for money had remained on the 1927 level will never be known. It is a fact, however, that the prevailing rate for prime commercial paper in New

[4] *Federal Reserve Bulletin*, December, 1928, p. 836.

[5] *Monthly Review*, Federal Reserve Bank of New York, January, 1929, p. 2.

[6] *Ibid.*

[7] *Federal Reserve Bulletin*, December, 1928, p. 836.

York remained on a higher level throughout 1928 than the previous year. In December, 1928, the prevailing rate was 5.25–5.5 per cent against 4.25–4.5 the previous year. The rate on prime commercial paper as reported by the *Federal Reserve Bulletin* reached a peak of 5 per cent in May and 5.5 in July, and remained on this level throughout the rest of the year. The fact that the volume of commercial paper outstanding declined from the beginning of the firmer money rates in November, 1927, would indicate that there was a relationship existing between the volume and the rates.

The higher rates on call money prevailing throughout the year have made it more profitable to lend funds on call than to buy commercial paper; this has caused a shifting of commercial-paper buyers to the call-loan market, which has forced upon the banks more direct financing of commerce through loans and discounts. If the "loans for the account of others" had gone into the commercial-paper and acceptance markets, they would have more than offset the demand for commercial-bank loans and discounts and Federal Reserve funds. It seems then that the commercial banks and the Reserve banks have indirectly financed the stock-market speculation by financing commerce while the corporations whose production and marketing were being financed by bank credit lent their funds to the stock market. The increase in bankers' acceptances does not seem to offset the decline in the volume of commercial paper because bankers' acceptances are employed for the most part in the financing of foreign trade. The foreign trade of the United States increased during the year, and the acceptance market has been favored by reserve bank funds.

"LOANS FOR OTHERS" AND THE MONEY RATES

The source of the funds in the "loans for the account of others" has been the large gold imports; this has resulted in the unprecedented expansion of bank credit and made possible the new capital financing, increased production, installment selling, and larger profits. But while all this new development has been going on with cheap money a half billion of the gold has been ex-

ported, the demand for credit has continued unabated, and the call-loan market has bid up the rate for money until corporations and individuals have found it more profitable to lend their money on call than to invest in securities or buy commercial paper. The high call-money rates made a strong bid for liquid funds and the customers left the bill market and the commercial-paper market, as already discussed, and lent their money to brokers. This forced upon the commercial banks the demands for current business and the consequent increase in loans and discounts at the time when the reserves were declining. The member banks found it necessary to increase their borrowing at the Reserve banks to take care of business customers, and the Reserve banks assumed the obligation to support the bill market to facilitate the increasing foreign trade. These increasing demands for funds have forced up the rates for all classes of credit. But had the "others" lent the billion funds which they placed on the call market to the commercial-paper market and the bill market, the increased demand made upon the commercial banks and the Federal Reserve banks would not have occurred. In other words, the market could have financed itself out of the existing resources without the additional expansion of bank credit. "Others" withdrew their funds from the banks, the commercial-paper and bill markets, and left the banks to take care of business while the "others" lent their funds for the higher rates offered by the call-money market. The competition of the call-money market for funds set in motion in the money market the same demand and supply forces that operate in other markets and higher money rates resulted. It would be of great interest to present statistics to prove the relationship between the "loans for others" and the bank credit supplied for commercial needs, but such an investigation would be beyond the limits of this problem.

THE BANKS AND "LOANS FOR OTHERS"

The large corporations who have become lenders instead of borrowers have increased in number. But this practice has always been true of a certain number of well-managed and prosperous corporations. Moreover, insurance companies, New Eng-

land savings banks, and endowed institutions have always been lenders. In the past, so far as reliable statistics show, these lenders sought mainly long-term investments. The facts show at present that corporations, institutions, and individuals are seeking a very large amount of short-term loans. The banks receive most of the cash on deposit whether invested for short or long terms. The money in the country not needed for hand-to-hand use flows into bank deposits directly or indirectly. The banks use these cash deposits as reserves and increase their loan deposits to the amount that experience has indicated to be the margin of safety.

If a corporation deposited its money in a bank on interest, the bank would increase its loan deposits with these new cash reserves. If the corporation purchased securities with surplus funds and the seller of the securities deposited the money in the bank, the result would be the same. If the securities purchased were bonds or notes, the debtors would owe the corporation money due at a specific time. If the securities purchased were common stocks, the corporation would increase its earning assets but would have no call upon the money market except by offering these stocks for sale at the market price. In either case, if the securities were new securities, the money would go into new business through bank deposits into capital and labor and then again into bank deposits, and the resulting influence upon bank credit would be the same. But in the case of the purchase of bonds or notes, a debtor-creditor relation between the buying corporation and the selling enterprise existed, and when this money was deposited by the borrowing enterprise a debtor-creditor relation was created between the bank and the borrower. When the borrower pays the funds out to labor and the sellers of capital, the creditor relation is transferred from the borrower of the funds to the workers for wages and the dealers in capital, and the bank merely becomes indebted for the same amount to substituted creditors. When the debts of the enterprising borrower come due, he has had ample time to arrange for payment out of earnings, the sale of capital, or by new borrowings from the market, or from other lenders who would withdraw their funds from the

market and lend to him. The debtor-creditor relationship between the corporate lender and the borrower is not recorded on the bank's books and in practice is not even known. But the time element gives the debtor ample opportunity to provide for payment out of earnings or to get possession of the funds from some other business or money market arrangement, whichever may prove the most desirable.

This is a general description of the use of corporate funds in the past. With this brief statement of the usual practice to which the business community has been accustomed, a comparison can be made with the changed practice whereby the corporations have become lenders in the call-money market.

When a bank lends a corporation's funds to a broker for the corporation, the bank is an agent and the debtor-creditor relation exists between the corporation and the broker. The broker may pay to the bank funds already borrowed or make additional loans to customers. Whichever takes place, the funds flow into the bank and the bank deposits in the long run will be just the same as they would have been had the corporation paid off debts or bought securities or left the funds on deposit at the bank. In order to get the funds to lend for a corporation, an individual bank may have to call loans or sell securities to meet the request of the corporate depositor, but the circuit flow of these funds as soon as the broker gets them is through borrowers into the bank, and the total loans of the bank can be extended to the same amount as if the corporations had not lent the funds on call but had left them on deposit.

The debtor-creditor relation between the corporation and the broker is outside of the debtor-creditor relations existing between the bank and its borrowers, and the bank lends the same amount in relation to the total cash resources as if these outside debtor-creditor relations did not exist. But this relation was the same when the corporations bought bonds, commercial paper, and acceptances. The difference is that these debtor-creditor relations outside of the bank are now on call instead of on time. The brokers owe to corporations money on call, and the bank owes its depositors the money on call. The call loans for corpo-

rations do not seem to add to the amount of loans which banks can make upon a given amount of money. But the money lent by a corporation on call to a broker and deposited in the bank by the broker and lent again on call by the bank, or lent by the broker to his customers who buy securities from other customers who deposit the money in the bank, thus making it available for the bank to lend on call, creates at least two call loans upon the same funds, one by the corporation and one by the debtor bank. The volume of call loans on the same amount of money is hence larger by the amount of the loans by "others." The "others" have switched time investments into call loans. No additional money has been added to the market. New money for increasing bank loans is obtained only by importing gold or acquiring more reserve bank funds.

When the corporation bought bonds, commercial paper, and acceptances and the bank lent excess funds on call, the money was all at work. Now when the corporation declines to buy investments and short-term paper and substitutes loans on call, it is up to the bank to absorb the investments and the bills and let the corporations have the call loans, or the volume of such investments and bills will decline and in the same ratio the volume of call loans will increase. This is what happened during 1928. The volume of bonds and commercial paper sold declined. Call loans for the account of "others" increased. Call loans for the reporting member banks in New York City decreased. Loans and discounts by member banks were increased to take care of the short-term financing of business formerly done by commercial paper. The Federal Reserve buying of acceptances increased, and the member bank borrowings at the Reserve banks were likewise increased. From this process of reasoning it seems that corporation call loans have been increased at the expense of other forms of corporation investments. The commercial-paper market was thrown upon the banks mainly in the form of demands for increased loans and discounts, and the bill market was left to the commercial banks and the support of the Federal Reserve banks. Indirectly the Federal Reserve banks furnished the funds by buying bills and lending reserves to the member banks.

From this evidence the conclusion can be drawn that the corporations invested their surplus funds in call loans and, the commercial banks not seeing fit to withdraw their call loans in proportion, the reserve banks advanced the funds to finance business. Stated in another way, the Reserve banks indirectly financed the call-loan market by furnishing new funds for business, while the corporations and the banks lent their money on call.

"LOANS FOR OTHERS" AND BANK RESERVES

The total volume of loans banks can make on a given amount of cash reserves is not affected by the "loans for the account of others." These loans made by corporations and individuals to brokers through banks as agents do not appear on the books of the banks involving them in debtor-creditor relations. They are outside of the bank loans to the brokers or the public and in addition to them. The banks maintain the required reserves against deposits, and the cash and loan deposits are the same in volume as if these outside debtor-creditor relations between "others" and the brokers did not exist. Clearly, the banker has no obligation to keep reserves against the loans of a customer to a customer. These loans in the long run neither increase nor decrease the amount of bank credit or bank deposits. Indirectly, of course, these outside loans may create new bank deposits by contributing to additional business expansion, which increases the volume of business and profits and thus brings to the banks larger cash deposits and larger demands for loans. On the other hand, this credit expansion may be the cause of overexpansion in business and bring about depression and declining prices, resulting in a shrinkage of bank deposits. But these long-run effects of this outside credit expansion are ultimate consequences and not immediate effects upon the volume of bank credit or bank reserves. These debtor-creditor relations outside of the banks do not enter into bank deposits in any way and have no reserves against them, and the ability of the creditors to collect depends upon the ability of the debtors to recall the money upon demand.

To the extent that the funds lent by "others" to brokers are deposited in the banks by the brokers or their customers and

the banks increase their loan deposits upon these funds, two debtor-creditor relations exist upon the same funds with only one reserve, and if both are call loans two calls are resting on the same funds with only one reserve. When the "others" invested their surplus and the banks lent the money on call, the time loans of the "others" furnished the cash reserves against which the banks made call loans.

When a corporation withdraws its deposit to lend to a broker, the bank can reduce the required reserve against the amount of the deposit, but if the bank is using the funds fully it will have to reduce its earning assets also to get the funds for the corporation. Since the corporation pays these funds over to another bank customer, the funds will flow immediately back into bank deposits and call for an increase in the reserves, and the bank will accordingly seek new loans and investments; hence there is no permanent reduction in the reserves required of banks because of the withdrawal of funds by customers to lend to brokers. There will be a change in the required reserves of banks if the banks leave the call-loan market mainly to "others" and increase their time deposits, because the required reserve against time deposits is only 3 per cent as compared with 13 per cent for demand deposits in New York. As a matter of fact, this is what has happened in recent years. The New York City banks have more and more withdrawn from the call-loan market and left the supplying of new call loans to "others" and out-of-town banks, while the city banks financed business, increased their time deposits, and thus reduced reserve requirements, placing the whole market in a less liquid condition.

WHY HAVE "OTHERS" LENT ON CALL INSTEAD OF INVESTING IN LONG-TERM SECURITIES?

It seems unnecessary to assert that lenders are seeking the highest returns with safety. Call-loan rates have been averaging higher than the yield on high-grade investments throughout 1928, and the safety of call loans has been demonstrated until fear of these loans on the part of bankers and business men has almost vanished. Safe loans at the highest rates of interest and the return of the money on call is about the choicest of liquid invest-

ments known. The attraction of the call-money market for those who have money to lend is evident because the call loans offer the most in return for the use of the funds. With rising interest rates, the trend of investment security prices is downward, and even though the "others" expect to invest these funds it is the part of good financial management to lend them on call until the downward trend of investment security prices has reached bottom. When the demand for call money slackens and the rates suffer a permanent decline caused by less attractive speculation, the investment market will not recover immediately, and those who withdraw their money from the call-loan market when its rates are not the most profitable will find investment yields at that time very tempting, because a loss of confidence in speculations is usually accompanied by a like loss of confidence in investments, but the more attractive yields on investments will draw funds to this part of the market.

Funds lent on call are reserves for new expansion and other needs of business planned later by the lenders. It is a known fact that corporate borrowers are lending on call funds obtained at much lower rates through the sale of securities while the use of these funds in business is for one reason or another temporarily delayed. Also corporations whose products are being financed in the distribution processes with 4.5 per cent acceptances and 5 per cent bank loans are lending their own surplus funds in a 7 per cent call-loan market. This is rather shrewd business on the part of the corporations. Many of these corporations of national and international character are well known to the bankers, but it hardly seems good taste to single out only the few that could be mentioned here. To say that many corporations have become so strong with cash resources that they are becoming their own bankers seems only to evade the whole situation. It has always been true that strong corporations build up a large surplus in diversified investments. Some may be stronger in this ability now than in former years. But when the yields on investments or good stocks increase to a more favorable rate than that on call loans, these same corporations will again seek the most advantageous use of their funds.

WHEN AND HOW WILL CALL LOANS FOR "OTHERS" BE REDUCED AND WHAT WILL BE THE CONSEQUENCES?

If "others" have lent their surplus funds to brokers on call because it is more profitable than to invest or use these funds in business, as seems to be the case, it is logical to conclude that the most profitable use of the funds will continue to be the guiding motive. Accordingly, these funds will be withdrawn and invested or used in the most profitable way when call rates decline until the profits from other uses for the funds yield the highest returns. A decline in the earnings of corporations, making the discounting of the future less attractive, would bring a decline in the demand for call money and a consequent decline in the rate for money on call. Then investments will become more attractive and call money will be withdrawn and invested. It has been said that these corporations and individuals have securities in the market and that they would leave their money on call to support the market for their own securities. This is not logical reasoning in finances. Each lender thinks he can withdraw his funds and invest in the most profitable way and that the other lenders will leave their funds on call. The withdrawal of the funds in the market by only a few lenders will bring pressure on the market and liquidation of securities wholly out of proportion to the amount of money taken out of the market. But this demand for money would increase the rate for call loans and the money would stay in the market or come back, it would seem. This is true only during a period of rising speculation. Speculators and so-called "investment buyers" pay the high rates for money because it is profitable. The possible profits in the market have attracted a large following to the market, and the demand for money has increased with the increased rates because the possible profits from speculation have increased even more. When speculation is dull and stock prices declining, it is a losing business to pay high rates for money and the demand for loans declines. When speculation is declining as stated, liquidation gains momentum as the prices decline and the money leaves the market, and liquidation eases the money market instead of increasing the demand for money.

From every angle of consideration it seems that "others" will withdraw their funds from the call-money market when some other use is more profitable. Then the burden of supporting the market will fall upon the banks. Brokers and individual customers will demand funds from the banks when "others" call their loans. A good example of this will be found in the statistics of loans during the last week of the year given in Table II.

TABLE II

COMPARISON OF LOANS DURING LAST WEEK OF YEAR OF THREE CLASSES OF LENDERS*

(000 omitted)

	January 2, 1929	December 26, 1928	January 4, 1928
For own account	$1,516,049	$1,109,301	$1,511,177
For out-of-town banks	1,647,988	1,659,899	1,371,213
For others	2,166,066	2,322,227	927,633
Total	$5,330,103	$5,091,427	$3,810,023

* Weekly report of the Federal Reserve Bank of New York.

Corporations called loans for the year-end dividends and bonuses, and individuals no doubt had to have some money for the holiday season and the year-end expenses. But as the loans by "others" were called, the banks in New York had to come to the rescue of the market and increase the loans for their own account. Using these figures as representative of the results of "others" calling loans when it becomes profitable for corporations, individuals, and foreign lenders to take their funds out of the market for investment or business, the banks will be called upon to increase their loans and shoulder the burden of the outside loans now created by the "others" and in no way controlled by the banks or even recorded in the bank accounts.

The "others" (corporations and individuals) are lending their surplus funds for financing speculation while the banks borrow reserves from the Federal Reserve banks and finance business, making still more profits and surplus funds available to the lenders in the speculative market. But when the speculative market ceases to be the most profitable market for money, the "others" will use their business freedom and withdraw their funds

from the call market and invest in the most profitable market. This will throw upon the banks the burden of assuming all the call loans for which the banks are not now responsible or the banks will be blamed for allowing the market for their own securities and those of the whole community to go down in confusion. This seems to be the logical consequence of these loans for "others" and the speculative market built up with them. The increase in the loans for "others" may, and probably will, continue with this "endless chain" of pumping funds out of the Federal Reserve banks until the excess reserves have completely vanished. If, however, this process of lending for speculation is carried to this limit, it will be impossible for the banks to come to the rescue of the market and take over the loans for "others" as the reserves will not stand any increase in the loan deposits and liquidation will be the only course until liquidation creates surplus reserves.

The remedy for the evil at its inception would have been for the banks to advance sharply the rates for commercial funds, maintaining the superiority of the commercial-paper and bill markets over the call-loan market for money and forcing upon the corporations advantageous economies by using their surplus funds for financing business instead of speculation.

The only remedy now seems to be a very sharp advance in bank rates, making commerce pay rates that will compete for funds with the call-money market. Any such advance in rates would be very costly to business and bring about depression, unemployment, and industrial stagnation. Corporations would find it necessary as well as profitable to withdraw their loans from speculation and finance their own businesses. But where would the speculators get the funds with which to pay? The banks would have to increase their loans on call and shoulder the demand loans of "others," or liquidation and loss to the security holders would be the only avenue through which to secure the funds. In case a sharp advance in the bank rates made it advantageous for "others" to withdraw funds from the call market, the process would be slow, and not all such loans would be called, the banks would take over a large amount of these loans while re-

serves held out, and heavy liquidation would take place. Should this be done? If this is the only solution, it would seem wise to bring it about while the surplus reserves are large enough to enable the banks to absorb the loans by "others," as liquidation will be the only course if the loan expansion continues until the reserve funds are exhausted.

CONCLUSIONS

1. The flood of money for the financing of speculation during recent years is the result of the large post-war gold imports and the easy-money policy of the banks. This encouraged business expansion, new capital issues, and refinancing at low rates, which created large profits and surplus funds in the possession of corporations and individuals.

2. "Loans for account of others" have furnished most of the funds for brokers during 1928. These loans are not bank credit but additions to the bank credit in use without a proportionate increase in the country's cash reserves. The debtor-creditor relations between "others" and the brokers are not bank credits. The banks are just agents. During 1928 the banks maintained their loans on call, financed business through borrowings from the reserve banks, and the "others" added more than a billion to their call loans.

3. Loans on call to brokers supply funds directly to industry and commerce, and the danger lies in encouraging an overexpansion of business and perhaps bringing a decline in prices.

4. There is no evidence that loans to "others" have cut into savings. From evidence available it seems that savings will reach record heights during this period.

5. The customers of the commercial-paper, acceptance, and bond markets have turned their funds into the more profitable call-loan market and thrown the financing of current business and commerce upon the banks.

6. The high call-loan rates have drawn money from the other money markets, and the demands from the business markets, falling upon the banks, have forced up the bank rates and tightened money rates in all markets.

7. The loans for "others" neither increase nor decrease the amount of bank credit the banks can extend upon the same amount of money reserves in the country. By the increased use of reserves the banks have financed commerce while the "others" used their funds in speculation. If the banks had reduced their loans on call as "others" increased their loans on call, the demand made upon the Federal Reserve banks for more reserve funds would not have been necessary.

8. Loans for "others" do not create bank deposits and have no reserves against them. But as the banks have reduced their demand deposits and increased their time deposits in taking over the financing of business formerly done through the commercial paper market, the reserve requirements have been reduced.

9. "Others" have lent on call instead of investing in long-term securities or promoting new business because it has been more profitable. When investing or new business becomes more profitable than call loans, these funds will be withdrawn from the call market for the more profitable uses.

10. When "others" withdraw their funds from the call-loan market for more profitable uses, the banks will be called upon to take over the loans by "others," which will require increased reserves. Liquidation will accompany this adjustment, and if the country's bank reserves have been used up by the "endless chain" process described before this adjustment comes, liquidation will be the primary solution.

The argument that debtors will pay for the stocks held and that this will prevent a decline is contrary to the motives of speculators. When the belief becomes general that security prices will decline for any reason, the holders will rush to take profits and reduce paper losses. Bulls will turn bearish and, after selling their own securities, borrow the securities of others and sell them. Speculation to reduce prices is usually more drastic and hasty than speculation to increase prices.

IVAN WRIGHT

ON SUPPLANTING THE INDUSTRIAL FATIGUE CONCEPT

FATIGUE, to the average man, means simply the state of being tired. He needs neither management engineer nor industrial physician to tell him when he is fatigued, for that is a matter of his own immediate knowledge. Fatigue is to him another name for weariness; it is a general state of feeling. In general terms we may say that the common-sense concept of fatigue is almost entirely mentalistic or subjective, so far as it has specific meaning at all.

It is probable that most readers of this *Journal* now attach a more physical and concrete or objective meaning to the word, but before the advent of production executives and industrial engineers the term carried little such significance in its common usage. Of course the physiologists have long had their technical definitions of fatigue as related to muscles, nerves, and other structures; and the psychologists as well, who have been prone to follow the physiological definitions rather than a subjective one which would more closely approach the common-sense notion. The industrial group has sometimes followed the physiological approach, but has more frequently made use of a different, although still an objective, concept of its own. The industrialists apparently reasoned that since the feeling which workers report as "fatigue" bears small relation to productive capacity at the moment, or to output, fatigue itself must be something other than a subjective matter. That it would have been just as logical to conclude that "fatigue" is only of incidental industrial interest seems not to have occurred to students of the subject until quite recently.

It was only natural that the mentalistic concept of fatigue should have been subjected to attack, since psychology has for a number of years shown impatience with data introspectively obtained, and industry has never trusted the assertions which workers made about their physical condition as affected by their own labor. In the case of industrial fatigue we encounter not

only the ordinary difficulties residing in the introspective method, but also strong motives for malingering through voluntary misrepresentation. As a matter of fact, careful experiments have established that there is little correlation or sometimes even a negative correlation between fatigue feelings and work output. To escape these difficulties, however, the industrialists and the scientists have traveled in different directions. We have two broad classes of fatigue definitions corresponding roughly to these two groups, and we shall need to consider each separately before we can appraise properly the present value of the fatigue concept with respect to human labor.

In industrial usage, fatigue is often held to be simply that effect of doing work which results in a lowered capacity for the continuation of such work. The lowered capacity is inferred when a drop in the output is observed. Thus by avoiding specific reference to the nature of the alleged effect of work, and recognizing only one of its external manifestations, it becomes possible to measure "fatigue" by the simple expedient of merely observing decrements in output per unit of time. The obvious difficulties inherent in such a definition and such a scheme of measurement are that a multitude of factors other than previous work can bring about diminished output, as well as the even more disturbing fact that output rate sometimes rises rather than falls with the continuation of work. Both of these facts have been demonstrated at various times in the past and need no illustration here.

On the physiological side, we find definitions phrased either in terms of the exhaustion of energy-substance or the accumulation of toxic metabolites, or both; or else an entirely different viewpoint is taken, and fatigue is defined in terms of certain obscure changes taking place in the nervous system. All of these physiological definitions have in common the one characteristic that they do describe certain physiological changes which occur as a result of muscular work, but it is quite arbitrary to declare with finality that they shall, therefore, constitute what we have come to know under the name of "fatigue." This may constitute "muscular fatigue" in a technical sense, or

"retinal fatigue" in a technical sense, but it does not correspond to the primary meaning of the fatigue concept. Furthermore, the tests which have been made in industry, based upon such conceptions of fatigue, have shown as little correlation with production as have the subjective fatigue reports themselves. Such a conception has, therefore, no more practical claim for industrial recognition than the subjective one, and has less historical and philological right to such recognition.

The importance of clarifying our fundamental concepts becomes evident as soon as we begin to consider the subject of "fatigue" measurement. We have contended above that "fatigue" is a subjective concept. If this is true, then it must be observed introspectively, and reported in subjective terms. But quantitative comparisons are really without special significance when they refer to subjective concepts, as we can see by examining a few examples. We speak loosely of this object being "twice as beautiful" as that object. It is commonly understood that this comparison is not actually quantitative; no one has measured the "beauty" of both objects and expressed the results in the form of this ratio. In a strict sense, it is not possible to measure the "beauty" of any object. We may even determine by experiment that this object is admired by twice as many persons as that object, but this is not equivalent to discovering that the one is twice as beautiful as the other. Are we to regard a Strauss waltz as being a hundred times more beautiful than a Chopin *étude* merely because it may have that much wider an appeal? No, we are forced to say that such quantitative comparisons are irrelevant and meaningless because the concept of "beauty" is fundamentally subjective in its nature. The question, by its very nature, is unanswerable.

The situation is similar with respect to fatigue and fatigue tests. Someone "measures" fatigue as conceived by either of the objective types of definition, and announces, let us say, that the men are "just 50 per cent as fatigued as they were last week." This may mean that the loss in output at the close of work is only half as great as it was last week, or it may mean that a certain physiological disturbance is only half as prominent, but

it cannot be taken to mean that certain quantities of "fatigue" were detected, measured, and recorded in each of the two weeks, and these two "quantities" compared against each other in order to find the ratio mentioned. Human fatigue cannot be handled quantitatively; when we speak of it in quantitative terms we are either speaking loosely, or else we are talking about something else.

One expects the rejoinder that this is after all a mere haggling over definitions, and that the practical man may quite properly continue with his fatigue tests while the theorists quarrel. To this practical objection, then, let us give a practical answer. No "fatigue test" has yet been discovered or devised which will measure satisfactorily even the objective entity for which it was intended.

The various indices relating to productivity, such as output, spoilage, accidents, sickness, and labor turnover, are imperfect measures of capacity because they are usually complicated by the influence of many extraneous factors, such as interest, incentive, weather, home conditions, various feelings and emotions, and many other kinds of disturbances. Tests based upon a neurological conception of fatigue are subject to a similar set of outside influences, as well as being highly dependent upon the co-operation of the subject. The theory of most of these tests is that fatigue lowers the ability to perform various voluntary acts, such as pulling a spring dynamometer or performing mental multiplication. The opportunity for malingering in such tests is evident. Because of technical difficulties, there have been but few attempts to devise fatigue tests based upon the physiological concepts of energy depletion or toxic accumulation, but the majority of so-called physiological fatigue tests have been of an incidental sort, such as the vascular skin-reaction test and the measurement of differences in electrical resistance of mucous membrane. Tests of this kind do not enjoy the support of even the rather dubious theoretical concepts we have discussed, but are based only upon a certain casual sort of empirical observation and deduction. Practically, this might not be a serious objection, but the fact remains that none of the "fatigue tests" so

far proposed have been found to give consistent and reliable results under all circumstances.

None of our criticisms should be taken as contradicting the worker's own interest in protecting himself from unnecessary or excessive fatigue, but it certainly is pertinent to inquire whether fatigue should be thought of as a primary object of industrial concern. We may find it to be merely an intermediate object of interest, and may discover that investigation of an altogether different intermediate step would lead more directly to the same end.

It has been contended with considerable plausibility that industrial executives and engineers are only incidentally interested in the amount of "fatigue" produced by various industrial operations; but that their interest actually lies in the long-time effects upon the worker of one set of working-conditions as contrasted with another. It is these long-time physiological effects which eventually reduce output, cause accidents, and produce industrial unrest; they constitute the real "industrial fatigue" which figures as an economic factor in production. But this is merely the cumulative aspect of what we are about to describe as "energy cost" and strangely enough, is what industry has been trying to get at all the time under the confused notion that it has been searching for "fatigue." Most fatigue studies based upon morbidity and accident rates, as well as upon turnover and even daily and hourly output curves, represent an effort to determine afterward the more permanent physiological effects of having worked under a specified set of working-conditions. The implied question to which such measures give answer really is not "How much 'fatigue' does this operation produce?" but is rather the more objective one of "What is the eventual physiological cost to the worker of this specific factor in his working-conditions?" The difference is more than a mere matter of terminology; it represents an attempt to clarify and objectify our ends.

If it is agreed that the latter is a more accurate and explicit phrasing of the question in which industry's chief interest lies, then the quest for "fatigue" as an answer to it should be sus-

pended and advantage should be taken of the techniques available for answering the question directly and immediately. The other possibility is to re-define "fatigue" to mean eventual physiological cost, or something similar in terms of the physiological effects of work, but it should be clear from our discussion that it is preferable to retain the fatigue concept in its original meaning—where it is still useful—and differentiate it clearly from the newer concept in industry of human energy cost. Studies of the energy exchange in respiratory metabolism are making it possible to determine physiological costs at the time they are being incurred, rather than having to wait for indirect evidence of cumulative residual effects as reflected in sickness and labor turnover.

It is an amazing thing that in this country so little use has been made of these measures in industry, and that they are relatively so little known to the executives, the psychologists, and the engineers whose concern it is to supervise the human factor in production. The total literature on the subject is tremendous, however, so we can hope to do no more now than outline a few of the more important techniques in use and touch lightly upon some of the industrial problems to which they have been, or may be, applied.

The determinations have their widest applications in the comparative study of energy costs when one major variable in the environment or the method of work is altered and the others held as nearly constant as possible. In this way, certain optimum values may be discovered with respect to the adjustment of working-conditions and equipment; or the cost to the worker of various environmental conditions may be revealed.

The three figures accompanying this article were selected to illustrate three quite different experimental methods of determining the energy consumption of the human body during work, although the underlying theory is the same for all methods. In briefest substance, this theoretical foundation may be outlined as follows:

Animals derive the energy they expend in work and heat from the oxidation of foodstuffs within the body. This process

involves, among many other things, the withdrawal of oxygen from the inspired air, and the formation of carbon dioxide, which is added to the expired air. A certain minimum rate of such gaseous exchange is a necessary accompaniment of the processes responsible for the maintenance of the body temperature, the beating of the heart, and similar activities, and is an index to what is known technically as the basal metabolic rate. Beyond this point, muscular work involves the oxidation of foodstuffs within the tissues in a fixed proportion to the amount of work done. To determine the amount of work done, then, would be a simple matter if we could in some way discover the amount of foodstuff which has been oxidized during the work period in excess of that required for the basal metabolic processes. We cannot hope to measure the amount of foodstuffs oxidized in the body by any direct means, but, ignoring certain qualifications, we can derive a computed figure of the amount if we know either the volume of oxygen which has been consumed or the volume of carbon dioxide given off during the period in question. It is like estimating the production of a still in gallons by observing the quantity of grain brought in or the amount of mash carried out. The unknown quantity can be computed readily when it stands in a constant relation to either the constituent or to the resultant elements which are known.

Figure 1 shows the relationship of the total carbon dioxide excretion during seven and one-half hours of uninterrupted work to the carbon dioxide excretion accompanying the ordinary continuous metabolic processes during the same period. This resting requirement was determined only once at the beginning of work, and the point thus determined (3 cc. CO_2 per sec.) was used in drawing the shaded area which represents the assumed basal requirement during the working-period. This should not be thought of as a requirement for carbon dioxide, of course; the carbon dioxide is a product of the combustion of the foodstuff that supplied heat and energy during the time. The requirement is for nutriment and the carbon dioxide is merely an index of the magnitude of that requirement and its consequent satisfaction. If no physical work had been done during the nights in question,

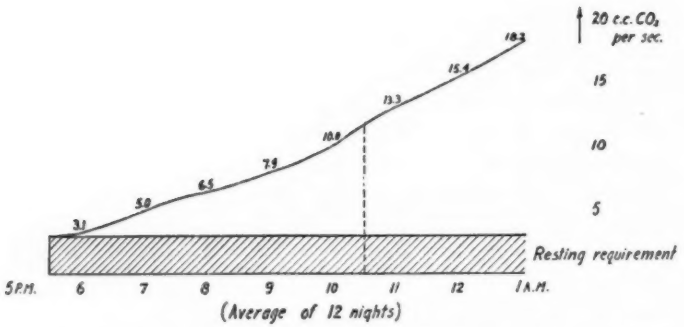

FIG. 1.—Night work in casting room, the *London Times*. Total energy cost = 1,466 calories. One-half of this cost was expended in the first five hours; the other half in the remaining two and one-half hours. (After A. D. Waller, *Jour. of Physiol.*, LIII [1920], cvi.)

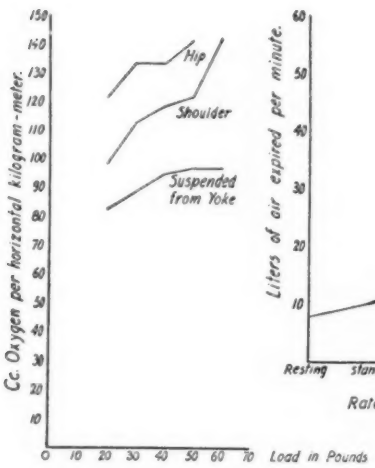

FIG. 2

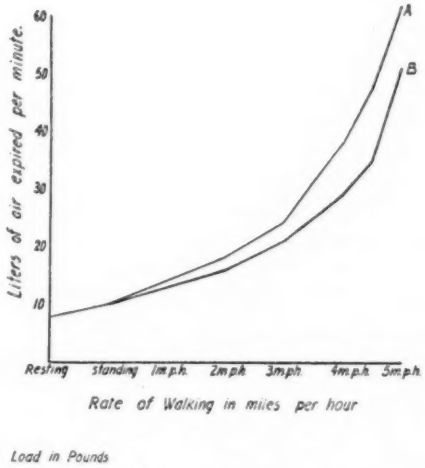

FIG. 3

FIG. 2.—Energy cost of carrying various loads by different methods. (Adapted from E. M. Bedale, Industrial Fatigue Research Board, London, 1924.)

FIG. 3.—Energy cost of walking at different rates: *A*, on lawn; *B*, on floor. (Adapted from Douglas and Haldane, *Jour. of Physiol.*, XLV [1912], 235.)

the total carbon dioxide excretion would have been fairly well represented by the shaded area at the bottom of the graph.

The most striking feature of the graph is the steady rise shown in the total CO_2 production curve. The external work accomplished remained relatively constant from hour to hour during each of the several nights, so it is evident that each succeeding hour's work was done at a comparative energy cost exceeding that for the hour preceding. So pronounced was this effect that the average human energy cost of the work of the last third of the night was equivalent to that of the first two-thirds. Continuous moderately heavy work of the type studied here, then, proceeds at a constantly increasing energy cost per unit of accomplishment.

Some workers in this field have made similar experimental observations, but have proposed that the rising CO_2 curve be considered a representation of the increasing fatigue under which the men are working. As we have seen, this is not the most useful way to treat such data. Subject to certain minor qualifications which are too technical for discussion here, we know that the exhaled carbon dioxide represents the actual energy cost, and that by a simple computation this may be expressed in terms of the number of calories expended. To call this "fatigue" would distort the significance of the data and deprive them of their useful quantitative characteristics, so we shall interpret the graph as picturing an increasing energy cost for equal units of external work and shall say nothing about the presence or absence of "fatigue."

If we stop here, however, we shall not have contributed much of practical value to the industrial executive. His interest is in learning how the excessive energy costs of the last few hours can be reduced. Experiments on this problem, utilizing these new techniques, are unfortunately few in number. Our present answer is more than a surmise, although extensive research is necessary before complete verification is possible. There is already evidence for believing that every rest pause introduced has the effect, not of temporarily depressing the CO_2 production curve, to be followed by an accelerated ascent soon

carrying it back to the point it would have reached without the interruption, but that there is instead an abrupt fall of the curve during the rest pause, followed by a return to no more than the former rate of increase on resumption of work. The drop in the curve, then, means an actual saving in energy cost represented by the area obtained by projecting that drop to form a parallelogram bounded by the line of the fall at one end, the close of the working-period at the other end, the projection of the original slope of the curve as the top side and the empirical CO_2 curve below it and parallel to it as the bottom side of the figure.

If further experimental investigation verifies the assertions just made, we shall be provided with a technique which will permit us, for the first time, to get into the physiology of the rest pause. Until now we have not known enough about the nature of the effect of rest pauses to enable us to employ them intelligently or scientifically in attempting to improve production. In the past we have simply introduced whatever seemed likely to be a suitable number of rest pauses, of whatever seemed to be suitable durations, and at whatever seemed to be suitable intervals. We then observed production, and perhaps other economic factors, over a period of several months from the date of installing the schedule of rest pauses. If production suffered a bit at first, we were patient, and were sometimes rewarded by seeing our output curve slowly rise month by month until the old level was surpassed. Possibly it would only be duplicated or maintained but perhaps there would be increased industrial satisfaction and still we would be satisfied.

The energy cost concept and the respiratory exchange technique promise to change the entire picture. If the results of the limited research so far published are to be accepted, we can determine the proper length of the rest pause in physical work by the rule of allowing just time enough for the CO_2 curve to drop almost to the resting point found before work was commenced. The number and spacing of the pauses then becomes the mathematical problem of securing the minimal total carbon dioxide formation compatible with a practical working-schedule and the

avoidance of any considerable drop in current production. The total carbon dioxide formation is graphically represented by the area between the curve itself and the base line; the other factors are determined according to the practices of the company or the department concerned. The installation of a schedule of rest pauses thus passes out of the trial and error stage and becomes an exact science.

It is true that these methods have not as yet been used in actual industrial practice. It is also true that there is one rather important gap in our logic. We are trusting that if a working-schedule with rest pauses is arranged by means of these new techniques so that there is little or no fall in daily output, but an appreciable saving in human energy cost, there will be an eventual rise in production beyond the original rate more or less in the proportion that there has been a saving in current energy expenditure. This may be an optimistic expectation, but it is by no means groundless. We still need a great deal of research, but surely no subject in the whole field of human relations in industry provides a more hopeful realm for experimentation than this.

A program of industrial experimentation of this sort is faced by a serious dilemma which we must speak of briefly here. We have mentioned that energy consumption over a certain period of time can be computed either from the recorded quantity of oxygen consumed or the quantity of carbon dioxide produced. This would be strictly true only if the body were a very simple physiological mechanism using food of uniform composition and working always in just the same way with no complicating factors to be reckoned with. Actually, there are many complicating influences possible in these experiments, and it so happens that their chief effect is toward invalidating conclusions based upon the rate of CO_2 production, while having little effect upon computations based upon oxygen consumption. In the laboratory this is a matter of no great moment, as it is about as easy to secure the one kind of data there as the other; but this is not true in industry. There are many more technical difficulties involved in measuring the oxygen consumption of workers at the

bench than are encountered in the measurement of their carbon dioxide excretion. So the industrial engineer or other experimenter has had to choose between a method which may be readily employed in the factory but whose results are open to criticism, and a method which is more nearly unimpeachable scientifically but which cannot be employed without playing havoc with production. The only perfectly acceptable experiments are those in which measurements are made of both oxygen and carbon dioxide. The result has been that Waller, the British physiologist who published the CO_2 curve we have been discussing above, stands as a more or less solitary advocate of the use of this method in industry; and there has been almost no work done under factory conditions using the more complicated techniques.

Recent workers, fortunately, have been able to improve upon the older methods so that there is now good prospect of progress in the direction of both horns of the former dilemma. There is evidence that the carbon dioxide method may be made valid and significant if certain precautions are taken and certain limitations observed in drawing conclusions; the oxygen measurement method has become practicable in the factory with Benedict's recent development of a portable apparatus which may be strapped to the worker's back and worn without seriously interfering with production. More than this, there is the possibility that for some purposes we shall be able to dispense with the separate measurement of either of the gases, and learn many facts of value from merely observing the total amount of air expired during the working-period, or even the amount expired during sample intervals scattered through the working-period.

The oxygen consumption method was employed by E. M. Bedale in a study of the comparative efficiency of eight different methods of weight-carrying. The most efficient, the least efficient, and one average method have been selected as representative and are shown graphically in Figure 2. This is not a factory investigation, but a laboratory experiment typical of numerous studies of working-methods which have been carried

on in England and on the Continent. The differences in energy cost, as may be seen, are anything but insignificant, and a number of important generalizations may be drawn from the original study.

The method of observing the total amount of air expired only, without concern for the amount of oxygen consumed or the carbon dioxide produced, is not easily defended on theoretical grounds. Evidence has been accumulating over a long period of years, however, that when properly interpreted the technique may have certain uses of high practical value. Figure 3 is a graphical presentation of the results of an early experiment which reveals the sensitivity of the method. Theoretical objections lose much of their force before such a demonstration of the method's consistency and delicacy.

We have illustrated in our discussion only a few of the many possible applications of respiratory exchange techniques in industry. Their number includes practically every problem in the field ordinarily spoken of as industrial "fatigue study" with the exception of fatigue from mental work, and certain problems concerning static work and the use of restricted muscle groups. By replacing the fatigue concept with that of energy cost, we achieve at once a mode of attack which permits of quantitative treatment and which escapes even remote alliance with subjectivity. Hours of labor, working-conditions, arrangement of material, handling of tools, methods of work, and even such factors as the use of incentive plans are all within range of this fresh point of view. We wait now only for a more complete realization of the utility of the methods on the part of industrial leaders and the training of investigators in the use of the new techniques.

This latter is a rather difficult problem as there is no compact textbook on the subject and much of the reference material is found only in German periodicals. The prospective experimenter must cover both a theoretical and a practical literature in order to equip himself properly, which is doubly difficult because the material of each is widely scattered and not easy for the novice to organize. The writer is engaged in preparing a

bibliographic study which may serve as a guide to the literature for those wishing to understand and to use the new experimental tool; but in the meantime the appended bibliographic notes may be of some service in an introductory way.

BIBLIOGRAPHIC NOTES

The most widely accessible single reference for those wishing merely to acquaint themselves in a broad way with modern developments is probably Poffenberger's *Applied Psychology, Its Principles and Practice* (Appleton, 1927). This book carries chapters on the influence of environmental conditions and discusses the use of metabolic methods in the study of distraction, methods of work and various topics ordinarily considered under the head of "industrial fatigue."

All workers in this field should be familiar with Muscio's article in the *British Journal of Psychology*, XII (1921), 31, under the title of "Is a fatigue Test Possible?" This is a penetrating and constructive criticism of the fatigue concept. Lee and Vanbuskirk report negative results with a wide variety of physiological fatigue tests in "An Examination of Certain Proposed Tests for Fatigue," *American Journal of Physiology*, LXIII (1923), 185.

The first half of A. V. Hill's *Muscular Movement in Man* (McGraw-Hill, 1927), consists of an excellent summary of the modern physiology of muscular work, explained in reasonably non-technical terms. There is no satisfactory reference on the use of the respiratory technique in industrial work studies, although E. F. Du Bois' manual entitled *Basal Metabolism in Health and Disease* (Lea and Febiger, 1927), will be found helpful in understanding theoretical foundations and developing acquaintance with apparatus and methods.

Benedict describes his portable device for measuring oxygen consumption at work on pages 816–18 of his article "Some Techniques for Measurement of the Gaseous Metabolism of Humans" in *Boston Medical and Surgical Journal*, CXCIII, Part II (1925), 807.

Waller describes his carbon dioxide method in the *Proceedings of the Royal Society*, XCI, Series B (1919), 166.

E. Simonson made some use of the method of observing total respiratory volume alone in a series of studies of physical work, rest pauses, and such matters. This is available only in German, the references being in Pflüger's *Archiv für die gesamte Physiologie*, CCXIV (1926), 380–415, and CCXV (1927), 716–67.

The Industrial Fatigue Research Board of London has published numerous experiments, one of which (E. M. Bedale, *Report Number 29*, 1924) has been quoted above.

E. Atzler's *Körper und Arbeit* (G. Thieme, 1927) is recommended as a general reference to those to whom it is available.

RICHARD M. PAGE

THE PANAMA CANAL AND THE WEST

IN CONSTRUCTING and operating the Panama Canal as a public enterprise, the government of the United States was moved by both political and economic considerations. The general public probably grasped more clearly the political than the economic possibilities, since the spectacular trip of the Oregon around the Horn in 1898 clearly demonstrated the advantages of a waterway across the Isthmus as a means of defense in time of war. For the most part, ideas on economic effects were rather hazy, though, in general, economic advantages were taken for granted.

From 1902, when the French rights in the Canal Zone were purchased, until 1914, when the first commercial ship passed through the Canal, construction problems were foremost. From 1914 until 1918, when the Armistice was signed, commercial possibilities of the Canal were obscured by the fact that boats were almost entirely taken from the intercoastal trade because of the more lucrative European war trade, and by the fact that government operation of the railroads removed from railroad officials the immediate problems of tonnage and earnings.

CANAL BRINGS PROBLEMS AFTER ARMISTICE

Between 1918 and 1928 the Canal proved itself to be a very important commercial factor. Complaints have been made that economic effects have been far different from those anticipated during earlier years. Transcontinental railroads, intermountain jobbers, manufacturers and distributors of the Middle West, exporters on the Pacific coast, and others are positive in pointing out serious losses which they have incurred because of Canal competition. Producers of wheat, lumber, fruits, copper, potatoes, and other products in vast areas of the western United States are now watching with apprehension the loss of railway revenues in the West, fearing a modification of rates on their respective commodities to make possible adequate returns to the

railroads. Atlantic coast interests, Pacific coast jobbers, boat-owning interests, and others, it is asserted, have received the benefits which the others have lost.

It is needless to state that it is almost impossible to discuss the effects of Canal operation without appearing to take sides in a conflict involving personal, sectional, or group interests. The construction and operation of a canal through public enterprise could not be expected to react with equal degrees of favorableness on different groups, sections, or persons. When there is a conflict between these interests, public need and welfare ought to determine public policy. Injury to some and benefit to others ought to be merely incidental to the main purpose. It is the purpose of this article to examine some of the claims as to losses and benefits; not to take sides with contestants, but to test the contribution to general welfare, and to suggest modifications in public policy which will better provide for the future needs of the country, and which may at the same time lessen unnecessary inequalities of opportunity.

EXTENT OF CANAL COMPETITION

Some hope has been held out to those who suffer from disadvantageous Canal competition that the Canal is fast reaching the limit of its physical capacity and that relief will be obtained in the future through the natural course of events. This is not the belief of some who are closely identified with the operations of the Canal. A former governor has published a statement to the effect that only part of the present capacity of 50,000,000 net tons lockage has been utilized, and that it would be possible to increase the capacity to 100,000,000 net register tons by duplicating present facilities as needed.[1]

Examination of Canal records will bear out this statement. During the period from 1914 to 1927, the total net tonnage of the Panama Canal was 174,677,954 tons. The total cargo for the same period was 185,655,490 tons. Panama Canal net tonnage is the space of the carrier which may be used for cargo or pas-

[1] Jay J. Morrow, *Maintenance and Operation of the Panama Canal* (1923), pp. 33–34.

senger transportation divided into units of 100 cubic feet each, exclusive of portions of the vessel used for propulsive equipment, crew's quarters, etc. A ton of cargo may be 40 cubic feet, 2,240 pounds, or 2,000 pounds, depending upon the character of goods transported or the section of the United States in which the shipment originated. While in theory a Panama Canal net ton is approximately two and a half cargo tons, because of movement of ships through the Canal in ballast, and because of the fact that it is impossible to fill each 100 cubic feet to capacity because of the character of the goods, etc., ships passing through the Canal have carried on the average 1.06 tons of cargo for each ton of capacity for the fourteen years the Canal has been in operation. On that basis we may assume that the cargo capacity of the Canal at the present time is a little more than 50,000,000 cargo tons, which is the equivalent of about two billion bushels of wheat, more than twice our annual wheat crop in any post-war year. The construction of additional facilities would increase the capacity by another 50,000,000 tons. The Canal would then be able to carry an equivalent of four or five times our present annual wheat crop. If the direction of cargo should shift so that vessels would cease to go through the Canal in ballast, and if the character of goods should become such that the total capacity would be more nearly utilized, a slight exercise of imagination enables one to see the capacity of the Canal increased still further. The greatest tonnage which has actually gone through the Canal in any year was approximately 29,600,000 tons in 1928, so the Canal has a vast unused capacity for further competition with railroads.

INCREASE IN COMPETITIVE TONNAGE

The Canal traffic at present includes goods transported to or from the Pacific coast for domestic consumption, goods transported from the Middle West or Mississippi Valley destined for a foreign country by way of a Pacific port, and goods shipped to the United States by way of the Pacific. This traffic may be considered competitive, since in any of these cases these goods may furnish tonnage for railroads of the western United States. Canal traffic also includes goods, such as petroleum and petroleum

products, which because of their nature or destination are non-competitive, since they would not normally furnish tonnage for the railroads. Records for past years show that non-competitive tonnage through the Canal has fluctuated widely, while competitive general tonnage has shown a consistent growth each year since the World War. The report of the governor of the Panama Canal for 1928, after stating that fluctuations in traffic during previous years have been due largely to fluctuations in tanker traffic, calls attention to the fact that the heavy increase in 1928 over the preceding year was due largely to general traffic. "In Panama Canal net tonnage the tankships decreased 1,380,143 tons, while general cargo vessels increased 4,610,962 tons, a net increase of 3,230,819 tons."[2] One notable example of an increase in competitive tonnage cited in this report was that of wheat, which rose from 1,477,376 tons in 1927 to 3,035,884 tons in 1928, an increase of more than 105 per cent.[3]

These steady increases in general tonnage indicate that the transcontinental railroads are losing each year a larger amount of traffic to their water competitors.

There has been much controversy over the extent and seriousness of this loss of tonnage by the transcontinental railroads to Canal carriers. Some students of the problem are inclined to consider a ton carried by the railroads in every way the equivalent of a ton carried by water, and to conclude that the few million tons of competitive freight that go through the Canal are a negligible quantity when compared with the hundreds of millions of tons carried by the western railroads. One witness before a Senate committee in 1926 testified that the total competitive cargo tonnage, both east and west through the Canal in 1924, according to Canal reports, was 5,217,636 tons, while the entire tonnage of the group of railroads listed by the Interstate Commerce Commission as western railroads for the same year was 627,754,000 tons. Accordingly, the competitive tonnage of the

[2] *Report of the Governor, Panama Canal* (1928), p. 9.

[3] *Ibid.*, pp. 16, 17.

Canal would be less than 1 per cent of the total of the western railroads.[4]

INCONSISTENCIES IN COMPARISON OF TONNAGE

There are three significant facts which those holding this point of view apparently have failed to consider. The first one is that figures for western railroads include those of many roads which are not seriously affected by Canal competition. Some of the most prosperous roads in the Mississippi Valley are listed by the Interstate Commerce Commission as western railroads. In some cases, instead of being injured by Canal competition, the roads enjoy a very profitable haul to Gulf ports as the first stage in transportation by way of the Canal. These roads are really a part of the competition which has injured other western roads so severely. Others of the western group of railroads are prosperous Middle West or Corn Belt roads. While they may be affected by Canal competition, they have such a large bulk of business independent of the transcontinental haul that they are not vitally injured. It seems that the tidewater Pacific coast roads are the ones that feel Canal competition most keenly. Some of these roads are transcontinental roads. All of them have a low traffic density, and all of them feel keenly the loss of even a small amount of traffic. From a strategic standpoint the transcontinental railroads are vital as a means of national defense. Any comparison of tonnage which leaves out of account the extent of the ill-effects of Canal competition on the tidewater roads is apt to give an entirely wrong impression of the effects of Canal competition on the general welfare.

The second fact which was apparently not considered is that in the case of tonnage transported by water carriers, only competitive tonnage was included in the total of 5,217,636 tons, while in the case of the western railroads, all tonnage was included. Even non-competitive coal and ore helped to make up the grand total of over six hundred million tons.

The third fact not considered is that the length of haul is important in the comparison. If the freight which went through the

[4] J. A. Ford, *Report of Senate Hearings*, S.B. 575 (1926), p. 62.

Canal had been carried by rail, the average length of haul for each ton would probably have been at least two thousand miles. The five million odd tons carried would thus have constituted about 10,643,000,000 ton miles. According to statistics of the Interstate Commerce Commission for 1924, the railroads which reach Pacific tidewater and which consequently would have had some part of this tonnage, in 1924, had a total of about 60,167,000,000 ton miles.[5]

The competitive traffic carried by water carriers, viewed from the standpoint of ton miles, was thus about 16 per cent of the total revenue ton miles of the tidewater roads. The revenue ton miles for all the roads of the western district for 1924 amounted to 136,025,388,713 ton miles. It will thus be seen that, notwithstanding the fact that the list of western roads includes some roads which are actually benefited by Canal competition and many that are but slightly affected by it, the competitive traffic carried by the Canal would, if translated into ton miles, be over 7.75 per cent of the total carried by western roads, instead of "less than 1 per cent" as stated. If the competitive traffic carried through the Canal, stated in probable ton miles, is compared with the total revenue ton miles of the United States, 388,415,312,335 for 1924, it will be seen that the competitive traffic of the Canal is equivalent to nearly 3 per cent of the total for all Class 1 roads of the United States.[6]

EFFECTS OF COMPETITION ON WESTERN ROADS

It is not possible to obtain statistics by which to compare the portions of the competitive traffic carried by each set of carriers.

[5] The railroads referred to as reaching tidewater are as follows: The Santa Fe; the Northern Pacific; the Great Northern; the Chicago, Milwaukee, St. Paul, and Pacific; the Southern Pacific; the Union Pacific; the Western Pacific; the Los Angeles and Salt Lake; the O. W. R. R. and Nav. Co., and the Spokane, Portland, and Seattle. The Union Pacific is not included since it reaches tidewater through the Los Angeles and Salt Lake and the O. W. R. R. and Nav. Co. If it is considered as a system and the Spokane, Portland, and Seattle is considered with the Northern Pacific and the Great Northern, there are only seven roads (*Statistics*, Interstate Commerce Commission [1924], p. lxxxix).

[6] *Statistics*, Interstate Commerce Commission (1924), statement No. 25, p. xxxix.

Limited studies have been made for given localities. These studies, as far as they have been made, indicate that water competition has cut deeply into competitive traffic. A representative of the San Francisco Chamber of Commerce found in 1924 that water carriers transported 49.6 per cent of the competitive tonnage destined to and from California points.[7] Representatives of the Great Northern and the Northern Pacific railroads claim that these roads have lost even greater percentages of competitive business.[8] During the early part of the receivership of the Chicago, Milwaukee, and St. Paul Railroad, officials of that road testified before the Interstate Commerce Commission that the loss of tonnage to water carriers was one of the major causes of the financial failure of that road.

A study of the returns of western railroads indicates that the rate level in the West, so long as the volume of traffic stands at the present figure, is not adjusted properly to yield an adequate return, which the Interstate Commerce Commission has fixed according to the Transportation Act at 5.75 per cent on the fair valuation of the roads of the territory as a whole. In 1923 Class 1 carriers of the entire western district earned only 3.75 per cent per annum on the valuation claimed by them, and only 4.35 per cent per annum on the tentative valuation adopted by the Commission for the general rate increase of 1920.[9] While the fair value has not been determined by the Commission for all of the railroads of the West, it may be safely assumed that their earnings are well below 5.75 per cent of their fair valuation.

From the beginning the transcontinental railroads have been handicapped by lack of tonnage. They have a low traffic density and a small ton mileage total when compared with other railroads of the United States. It has been repeatedly charged that transcontinental railroads have been overbuilt, that there are more railroads than business requires. It should not be forgotten that the competitive traffic carried through the Canal in 1924 would

[7] Seth Mann, *Reports of House Hearings*, S.B. 2327 (1924), p. 318.

[8] Charles Donnelly, *Reports of Senate Hearings*, S.B. 2327 (1924), p. 505.

[9] 107 *I.C.C.* 448.

have been equivalent to approximately 10,643,000,000 ton miles if carried by transcontinental railroads. This amount is almost 25 per cent greater than the total ton miles of the Great Northern Railroad, almost 60 per cent greater than the total of the Northern Pacific, greater than the totals of the Union Pacific or the Southern Pacific. Only the St. Paul and the Santa Fe, if considered as systems, had an amount equally large. In other words, the Panama Canal, as far as the ton mileage it has withdrawn from the railroads is concerned, is the equivalent of another transcontinental railroad reaching from Chicago to the Pacific coast. Diversion of this traffic to carriers using a Canal which was constructed after the last of the transcontinental railroads was built is one of the main causes of the condition which has given rise to the charge that roads in the West have been overbuilt.

It is fair to say that, while western roads have lost some of their business, roads reaching the Atlantic seaboard and the Gulf have gained some, since goods produced at Detroit, Pittsburgh, and other inland centers must go by rail to the Atlantic coast for shipment to the Pacific coast or the Orient. It is also true, on the other hand, that some of the goods carried by water to Pacific ports furnish backhauls for western carriers, so that, while they lost traffic which they formerly carried west, they regain the shipment at the Pacific port and carry it to its destination inland. Hence tonnage carried through the Canal is not in all cases entirely lost to the railroads.

EFFECTS OF THE CANAL ON THE MIDDLE WEST

Not only have the transcontinental railroads been adversely affected by Canal competition, but the Middle West has also suffered severely from the effects of Canal activities. The location of population and industry in the Middle West has been largely determined by rates offered by railroads serving the district, just as the location in the Far West of the citrus fruit industry, the lumber industry, the copper industry, and many other industries was determined by the same factors. Anything which removes the advantages of favorable rates will necessitate a serious read-

justment of industries and population. At least future growth and development will be checked.

That the Middle West has suffered such a loss of advantage was made apparent by a study made by the Department of Commerce in 1926, which compared the freight rates on a ton of steel goods, such as harvesters, plows, harrows, etc., from the Atlantic coast to the Pacific coast, and from Chicago to the Pacific coast before and after the World War. Before the Canal was put into operation in 1914, New York was 1,904 cents per ton away from San Francisco. In 1926, because of favorable Canal rates, though there had been no appreciable change in ocean rates as a whole, it was 1,680 cents away. Before the war, Chicago was 2,160 cents away from San Francisco; in 1926, it was 2,964 cents away. Chicago's raise of rates has a double explanation. First, in 1918, during the period of government operation of the railroads, relief under the Fourth Section was withdrawn and rates to the Pacific coast were raised to the level of rates at intermediate points, and, second, the general level of freight rates on shipments to all parts of the United States was raised during and following the war. Chicago, according to this calculation has moved 336 cents further away from the Pacific coast, while New York has moved 224 cents closer.[10]

That Chicago's disadvantage in rates is not greater than the figures given in the foregoing is due in part to the fact that the transcontinental railroads in 1923 voluntarily lowered rates on the competitive commodities named in the foregoing illustration, to both intermediate and coast points by amounts running as high as $7.00 a ton.[11] After all adjustments have been made, the Middle West, as far as freight rates are concerned, is farther from the Pacific coast than New York is. Part of the apparent disadvantage in rates, however, is offset by the fact that most products, or the raw materials entering into them, originate at an inland point and require a rail haul to the Atlantic coast, and the cost of this haul must be added to the New York to San Fran-

[10] *St. Lawrence Waterway Project,* Senate Document 183, p. 2.

[11] W. P. Kenney, *Report of Senate Hearings,* S.B. 2327 (1924), p. 576.

cisco water rate to determine the actual cost of delivery at the Pacific coast city.

Theoretically the changes in charges for transportation should cause readjustments of population and industry in the Middle West. Actually they appear to be doing so. A representative of the Chicago Association of Commerce testified to a Senate committee in 1924 that "there is not a day, any business day, that we are not constantly pressed on account of loss of business, not prospective but actual loss of business and the relocation of industries."[12]

Frequent reference has been made to the experience of two large Middle West concerns, one carrying stocks of general merchandise in the Middle West and on the Atlantic coast, and the other doing a manufacturing business with plants in the same general locations. Because of the absence of favorable rates by rail, both concerns were forced to transfer some of their activities from the Middle West to the Atlantic coast to care for business on the Pacific coast which for many years had been cared for by each from the Middle West.[13]

One Chicago traffic director said that "the building and operation of the Panama Canal completely revolutionized the trend of American transcontinental commerce."[14]

The Interstate Commerce Commission, in its majority opinion handed down March 1, 1926, admitted the plight of the Middle West, though this decision denied the relief asked for by the railroads.[15]

There are some who feel that the Middle West can get along without the business of the 5,000,000 people who live on the Pacific coast, since it still has its great home markets. Chicago, for example, has a territory reaching from 500 to 1,000 miles in all directions which for several decades has furnished a constantly growing local market for her products.

[12] J. P. Haynes, *Report of Senate Hearings*, S.B. 2327 (1924), p. 602.

[13] Butler Brothers, *Report of Senate Hearings*, S.B. 2327 (1924), p. 604; J. P. Haynes, *Ibid.*, p. 606; J. A. Ford, *Report of Senate Hearings*, S.B. 575 (1926), p. 59.

[14] Robert Hula, *Report of Senate Hearings*, S.B. 2327 (1924), p. 125.

[15] 107 *I.C.C.* 427.

But there is no reason to assume that growth of the Middle West as a home market will continue indefinitely. The phenomenal growth has been the result of favorable freight rates. The favorable freight rates to the Pacific coast have been lost, and as far as trade with that section is concerned, manufacturers and merchants have been forced to curtail their operations and move part of their respective enterprises to the Atlantic seaboard. With the loss of business activity, we may expect local markets to contract rather than to expand to take up the slack. Growth in population and industry must inevitably be checked. Without doubt the Middle West faces some very serious problems which have grown out of Canal competition.

COAST PRODUCERS HANDICAPPED

When the Pacific coast is considered, it is found that some producers have been benefited by the Canal. For example, oil producers of California have been benefited because their product could not have been handled advantageously by rail. Lumber producers have received benefits because of lower rates on the part of their product shipped to such markets as can be reached by water. But they must depend upon railroads to reach some of their most important markets, and they may lose the advantage gained by water transportation on their less important markets if, because of loss of revenues, the railroads must raise rates on their product to their more important markets which Canal carriers cannot reach. Those engaged in the production of wheat, copper, livestock, fruits, potatoes, and lumber in the intermountain region have secured less benefit from Canal transportation than producers of oil and lumber nearer the coast. They must depend entirely upon rail transportation to reach all their markets, even if part of the transportation is by water through the Canal. So must the producers of fruits and vegetables on the coast. As competitive tonnage continues to be handled in increasing proportion by boat, rail traffic becomes necessarily less. There can be but one result—rates must be raised on shipments of non-competitive commodities. The producers affected must stand the greater part of the loss which will be entailed by the raise, since the cost of transportation is deducted

from the market price of the product to determine the price which the producers shall receive. So producers in the intermountain region, even though the Canal is utilized to reach part of their markets, find themselves handicapped in competing with other producers.

EFFECT OF CANAL ON JOBBING BUSINESS

Intermountain jobbers have suffered severely from the operation of the Canal. On the forty-odd groups of commodities which can be transported by water, and which make up a large part of the goods handled by jobbers, the coast jobber has the advantage over the intermountain jobber of several cents per hundred pounds in freight charges alone. In the case of certain iron and steel products, for example, charges for rail shipments are $1.00 a hundred pounds from Chicago to Seattle, and the same to points in the intermountain territory. The same commodities may be delivered by water from the Atlantic coast for about 70 cents a hundred pounds. The differential enables the coast jobber to undersell the inland jobber in territory which the latter formerly controlled and which he looks upon as his own. The result has been that the intermountain jobber has suffered severely, and up to the present has found no relief from coast competition.[16]

The operation of the Canal has brought certain expected benefits to the Pacific ports, but these gains have been accompanied by certain unexpected drawbacks. It was anticipated that the coast cities would have the benefits of competition between Atlantic and Middle Western producers. But the competitive railroad rates, established under Fourth Section relief, were removed in 1918, and many of the benefits of that competition were lost.

EXPORT TRADE OF PACIFIC COAST AFFECTED

While the loss of competitive rail rates has not seriously affected the ability of coast cities to compete with neighboring inland cities as jobbing centers, since they have the advantage of lower water rates, the export trade of these cities has been seri-

[16] 107 *I.C.C.* 427, 463, 468, Appendix.

ously affected, especially in relation to trade with the Far East in the class of goods produced in the eastern part of the United States. Pacific merchants cannot procure goods for export from Middle West producers at prices which can compete with Atlantic coast prices on account of present prohibitive freight rates. It follows that coast stocks, as far as competitive goods are concerned, must be made up largely from goods shipped from the Atlantic section. If goods produced on the Atlantic coast are to be exported to the Orient, there is no reason to ship them to the Pacific coast when the shipment might better go directly to its destination through the Canal. It is admitted that there are many influences which modify this tendency, but in general the Atlantic producers have very important advantages in developing this business for themselves. That they are doing so is attested by the fact that shipments by rail for export to the Orient are declining, while business through the Canal between the Atlantic coast and the Orient is increasing. A vice-president of the Northern Pacific Railroad said in 1924 that, while the business with the Orient in goods produced in the eastern United States has greatly increased, "the movement by way of the Pacific ports is actually less than it was twenty years ago."[17]

It is a fact that Pacific cities, as export centers, enjoy a tremendous trade, quite independently of any influence of the Canal, in the products of their respective territories, lumber, canned fruit, canned fish, flour, wheat, etc. It is only in regard to goods shipped from the East to these ports for export that the loss is so pronounced.

EXPORT RATES INADEQUATE

The railroads now have rates to Pacific ports on goods for export which are far less than their domestic rates on the articles affected. For example, steel for export may be carried to Seattle from Chicago for 40 cents a hundred, whereas the domestic rate is $1.00 a hundred. This rate applies only to straight carloads, with the minimum weights running as high as 80,000 pounds a carload. It can apply to foreign trade only in those extraordi-

[17] J. G. Woodworth, *Radio Speech*, March 10, 1924, p. 5.

nary shipments in which the foreign buyer desires a quantity large enough to be shipped in 80,000-pound carloads. Without doubt, in such cases, this export rate is of benefit to steel producers in the Chicago district in their competition with producers of the Pittsburgh district. As far as the Pacific ports are concerned, it will benefit them in furnishing their citizens with jobs connected with transferring the goods from the railroad cars to ships for export. As far as export merchants of the port are concerned the rate is really a paper rate, since goods of like nature shipped to them for stocks, to be unloaded in their warehouses and reshipped as foreign exports, will carry the higher rate of $1.00 a hundred. They are thus at a disadvantage in competition with Atlantic merchants who have the lower rate through the Canal. What Pacific merchants must have to develop an export trade is rates which will give them access to the products of the Middle West under terms which will permit them to compete with Atlantic merchants. Such rates are at present denied through the refusal of the Interstate Commerce Commission to re-establish rail and water competition.

HIGHER CANAL TOLLS ONE SUGGESTED REMEDY

One proposal which has been advanced to relieve the conditions described in the foregoing is to increase the tolls charged for passage through the Canal. It has been maintained that Canal operating accounts omit several items which constitute heavy expense items for the railroads. One of these is taxes. Railroads of the United States paid in 1925 $359,000,000, or approximately 6 per cent of their gross income, in taxes. The rate was approximately 14 mills per dollar on the valuation of the roads.

Railroad rates must be high enough to enable the roads to pass the taxes on to users of the service. Users of the Canal are free from this burden. There are many who feel that it would be desirable for every government enterprise to make its contribution to the tax burden in the same way and at the same rate that private enterprises do. Even if one objects to the actual payment of taxes, there is no reason why the Canal should not consider taxes at the rate paid by the railroads as an implicit cost in esti-

mating the cost of operating the Canal. Investment in the Canal has been divided by accountants into two parts: one part, amounting to $275,000,000, is considered as a commercial investment; the other, amounting to $115,000,000, is considered an investment for national defense.[18] Estimates of implicit costs will be based on full valuation of the Canal rather than on this arbitrary division of investment, for reasons which will be given later.

If taxes on the full valuation of the Canal, approximately $390,000,000, were estimated at the average rate actually paid by the railroads of the United States, approximately 14 mills on the dollar, more than $5,500,000 would have to be added to the expenses of operation. Users of the Canal would be on a parity with users of the railroads as far as this one item is concerned.

The situation is similar when interest on invested capital is considered. It is probable that on their entire indebtedness the railroads pay a rate something over 5 per cent.[19] If the Canal were to compete on an equality with the railroads in this regard, an interest charge on the entire investment of at least 5 per cent would have to be added to the expense side of the operating account of the Canal. This would add an expense item of more than $18,750,000 a year which does not now appear in the profit and loss sheet in any amount. Taxes and interest together would thus add about $24,000,000 a year to expenses as now computed. The surplus of about $99,000,000 which accountants show has been earned during the last fourteen years of operation would be converted into a deficit of nearly a quarter of a billion dollars, approximately 60 per cent of the original investment in the Canal.

Not only do railroads have to cover taxes and interest by their rates, but they are compelled to provide, from earnings, adequate reserves for depreciation. Depreciation is a matter for experts, who seldom can agree, even among themselves, upon a definite figure. It is true that deductions for depreciation appear

[18] *Report of the Governor, Panama Canal* (1927), p. 99, Table I.

[19] Interstate Commerce Commission Reports, Docket 17021, brief by respondent, p. 35.

in certain of the Canal accounts. To a layman they appear inadequate. The 1928 report of the governor of the Panama Canal shows that a little more than $1,000,000 was set aside by accountants as a reserve to cover depreciation of the Canal and its equipment for 1928.[20]

Since the reserve set aside amounts to about 0.298 per cent of the total investment covered, it would indicate that the accountants assume that the Canal will have a usefulness approximately that of the present for about 335 years. If reserves adequate to cover depreciation from use and obsolescence on a basis similar to that used by railroads were deducted, much larger amounts would have to be added to the expense side of the ledger, thus adding to the deficit mentioned above.

IMPLICIT COSTS IN RELATION TO PUBLIC POLICY

There are many who object to the policy of considering implicit costs as a basis for Canal charges on one ground or another. It may be objected that the Canal is a government enterprise and that the government ought not to tax itself, or that the government secured its capital at low cost and that it ought not to profit from its dealings with its citizens. As far as depreciation is concerned, the government has never taken it into account in any case in which public safety and national defense are concerned.

The reply is that the policy of the goverment with regard to Canal tolls has a very important commercial significance. Failure to include all costs, actual or implicit, has the effect of subsidizing citizens of certain favored sections who are so situated as to receive full benefit of its use, or those engaging in certain favored enterprises who may be able to take full advantage of its facilities. Steel producers of Pittsburgh, with their rate of approximately 70 cents a hundred to San Francisco, have some measure of subsidy in the advantage they have over Chicago producers with their rail rate of $1.00 to the same point. Owners of ships using the Canal enjoy some measure of subsidy in their competition with railroads, which are compelled to pay all costs of operation.

[20] *Report of the Governor, Panama Canal* (1928), p. 5.

It may be objected that the Canal has important defense functions to perform. So have the railroads, the steel plants, the cotton mills, the highways, and all other wealth, whether it be owned by the public or by private citizens. Our present law recognizes the strategic value of the railroads and authorizes the president to take them over for defense purposes in case of war, as President Wilson did during the World War. In this war the railroads were a vital factor. Of course the Canal competition affects only western railroads, and really only a part of them. But through the railroads the Canal may affect the development of the entire western area of the United States. We can imagine that western wheat, western copper, western spruce, and, above all, access to the western coast by rail might be of great importance in a serious struggle in which the United States might in the future be forced to take part. Moreover, we may assume that the great Middle West may be the hope of final victory in a war to which the Atlantic and Pacific coast expose vulnerable positions. Yet as public policy is at present determined, the West and the Middle West are retarded in their development. It must be admitted by all that both the Canal and the railroads would be important agencies in any struggle that involved the United States. We may assume that the government would be far sighted if it would develop and protect both, having defense in time of war as its motive in each case.

Of course it will be borne in mind that the government has contributed vast sums to aid in the construction of both Canal and railroads. Only in the case of the railroads is the rate charged for services supposed to furnish an adequate return on the true and full valuation, including any sums furnished in money or land by the government.

COMMERCIAL FUNCTIONS MOST IMPORTANT

If the government cannot subsidize both railroad and Canal equally, it should forget the defense function of the Canal as it apparently has forgotten the defense functions of the railroads, and remember only the commercial functions of each. Coddling one agency in the hope of providing defense in time of war may

have serious complications. When the emergency comes the government may find that it is depending upon some factor, equally as vital as the favored one, which has been crippled by the coddling process. It is perfectly reasonable to ignore the defense functions of both railroads and Canal, and say that, as far as the merchant who uses the facilities is concerned, the entire investment should be regarded as a commercial investment and the charges made for the facilities furnished by each should cover the full cost of furnishing the service, including explicit or implicit taxes, interest, and depreciation.

How much tolls would have to be raised to cover these costs is a matter for experts. If they were raised in any amount at all, they would to that extent relieve the Middle West of the oppressive competition with Atlantic producers; relieve the intermountain jobbers of the competition of coast jobbers; relieve the transcontinental railroads of part of burdensome Canal competition; relieve the producers of the coast and intermountain territories of one influence which tends toward higher rates. Pacific ports would be benefited as export centers, though they would be injured by the loss of part of their advantages as jobbing points. Atlantic ports, territory tributary to them, and carriers through the Canal would be injured as the other groups were benefited.

Probably a raise in Canal tolls such as is here suggested is not politically possible, because of the intense sectional opposition which the proposal would meet. The plan is suggested, not only as a matter of justice to western interests affected, which makes the discussion one of sectional interests, but also as a measure to protect the future welfare of the United States if, as is generally conceded, the western territory and adequate means of access to it are vital to the country as a whole.

RESTORATION OF FOURTH SECTION RELIEF

Probably a more plausible proposal than that to increase Canal tolls is the proposal to restore relief under the Fourth Section of the Act to Regulate Commerce. This relief sets aside the provisions of the Fourth Section which make it unlawful for any

carrier subject to the provisions of the act to receive a greater compensation in the aggregate for the transportation of passengers, or of like kind of property, for a shorter than for a longer distance over the same line or route, in the same direction, the shorter being included within the longer, by permitting the carrier to charge less for the longer than for the shorter haul if authorized to do so by the Interstate Commerce Commission. It was by this arrangement that Seattle long enjoyed a lower rate by rail from Chicago than did Spokane which had a several hundred miles shorter haul.

Transcontinental railroads enjoyed this relief until 1918, during the period of government operation of the railroads, when it was withdrawn at the suggestion of the director general's office. It was felt that, coastwise vessels having been diverted to the more profitable war trade, water competition no longer existed. Before the roads were returned to private hands, the Esch-Cummins Act of 1920, added Section 500, a new provision, that "it is the policy of Congress to promote, encourage, and develop water transportation, service, and facilities in connection with the commerce of the United States, and to foster and preserve in full vigor both rail and water transportation." Acting under their interpretation of the requirements of this section, the Commission has refused to restore relief to the transcontinental railroads, though application has been repeatedly made.

There is nothing revolutionary in the railroads' petition for relief, since relief under the Fourth Section of the Act to Regulate Commerce has been applied in more than six thousand cases in the United States.[21] One traffic man said, in 1925, that in his opinion the preponderance of tonnage in the United States was carried under departures from established rates as permitted by the Fourth Section.[22] Until 1918, relief under the Fourth Section had been in force in the West almost continuously since water competition of any importance developed between the east and the west coasts. Under it, and partly because of it, the transcon-

[21] Interstate Commerce Commission, *Report Senate Hearings*, S.B. 2327 (1924), p. 113.

[22] J. P. Haynes, *Report of House Hearings* (1924), p. 270.

tinental railroads made their great investments and built up their present rate structures. Through its important assistance the Middle West has reached its present industrial and commercial development.

Withdrawal of relief in 1918, during the period of government operation, came at a time when neither the private owners of the railroads nor others affected could take measures to protect their interests. It is doubtful whether they would have protested the withdrawal, since it would not have been construed as a permanent change in the policy of the government.

Relief is now withheld by the Interstate Commerce Commission in the exercise of its discretionary powers. A restoration of relief would be merely a reversion to pre-war conditions. Such a move would keep faith with those who have made investments in the great Middle West, in the intermountain region, and in the Far West. By some this may be construed as a plea for restoration of Fourth Section relief under something akin to "vested rights." The idea of vested rights, however, it would seem involves the idea of opposing the right of the public to modify the property rights of a given person or group of persons, when public interest demands such a modification, or when the right in question is an unreasonable right or is used in an unreasonable manner. None of these conditions is present in the case we are considering. Economic and political considerations herein set forth show that the public interest justifies the protection of the property rights in question. It has been suggested that the sacrifice of the rights of those who have made their investments in good faith in the great Middle West, in the intermountain territory, and in the Far West is being made in the interests of business competitors by public agencies under the guise of public welfare.

ECONOMIC LAWS JUSTIFY RELIEF

Permitting a lower charge for a longer than for a shorter haul under Fourth Section relief, has been justified by students of railroad economics from President Hadley down to the present because of the fact that in the railroad industry about "two-

thirds of the expenses incurred under average conditions are constant," and consequently increases in traffic affect the net return out of all proportion to the amount of traffic involved. Even at lower rates, such as would be necessary under Fourth Section relief, the increase in net profits would still be greater than proportional to the increase in tonnage, the amount of increase, of course, depending upon how much above out-of-pocket costs the rates were. Whether the amount of traffic involved in the competition with the Canal carriers is 1 per cent, as stated by some or 16 per cent, as stated by others, and whether rates which must be made to permit the traffic to be carried by the railroads are equal to, or less than, the general rate level, there is sound economic justification for relief which will permit the return of part of the lost traffic to the railroads.

Practical observations seem to bear out the foregoing theory. Officials of the Great Northern Railroad testified to a Senate committee in 1924 that it could carry across the country 1,427 tons of freight a day without additional power, cars, or crews. Northern Pacific officials testified to substantially the same possibilities for that road. The Santa Fe reported 5,118,948,000 westbound empty car miles on six leading tidewater roads for the period from January 10, 1919, to November 30, 1924, as compared with 1,876,009,000 eastbound empty car miles on the same lines for the same period. The same investigation also disclosed that, although refrigerator cars can be loaded with any of the commodities involved in Canal competition, except fabricated steel, only 30 per cent of westbound refrigerator cars were loaded in 1925, because these competitive goods were being carried through the Canal. Formerly more than 60 per cent of these westbound cars were so loaded.[23]

The principle that joint cost products must sell for what they are worth to the user also justifies relief. The user of railroad services cannot be made to pay more than the services are worth to him. If Seattle has a water rate from the Atlantic coast of 70 cents a hundred for steel, that is what the transportation of steel is worth to Seattle. Spokane, located a few hundred miles inland,

[23] P. B. Hastings, *Report of House Hearings*, S.B. 2327 (1925), p. 558.

finds the value of the transportation of steel fixed, not by the rate paid by Seattle, but by the water rate plus the back haul to Spokane. The service for the longer haul to Seattle is actually worth less than the service for the shorter haul to Spokane. If the railroad cannot carry steel to Seattle for what the service is worth to Seattle, it cannot carry it at all, and boats secure the business. Allowing railroads to meet water competition would not create a discrimination against the inland point, but would attempt to minimize the bad effects of a situation already in existence.

Restoration of Fourth Section relief, if permitted, will aid materially in solving the financial problems of the transcontinental railroads. It will aid the producers of the Middle West by restoring to them the opportunity to compete with Atlantic producers for Pacific coast and oriental business. It will aid producers of the intermediate and coast regions by protecting them against advances of rates caused by inadequate earnings. It will benefit jobbers at Pacific ports by giving them the benefit of two markets and two methods of transporting goods instead of one, as at present. It will benefit export merchants by giving them access to Middle Western products which are essential to their export trade.

Intermountain jobbers would not be relieved from the oppressive competition of coast merchants. Atlantic-coast producers and merchants, owners of boats in the coastwise service, and eastern railroads enjoying a haul to Atlantic tidewater would lose in the proportion that western interests would gain.

WOULD LOSSES UNDER RELIEF EQUAL GAINS?

Fair-minded persons will ask whether the eastern and Gulf lines, the producers and merchants of the Atlantic seaboard, and the boat-owning interests would not lose as much as the western interests would gain. As far as the railroads are concerned the answer depends upon conditions. A million tons of freight to eastern and Gulf lines, which are operating at a higher traffic density, may not be nearly as important as to the western lines which are operating at a very much lower traffic density; and which are at present operating with inadequate earnings. As far

as eastern railroads are concerned, it should be remembered that the process would take nothing from them that they depended upon in making their original investments. During their period of development this business was in the hands of western roads. Relief would merely return to western interests what the government took from them in 1918, when it cancelled Fourth Section relief.

The same question may be asked concerning the water carriers. Would not the loss of traffic by water carriers to rail carriers hurt the former as much as it would help the latter? Again the answer is, no. The investment in railroads is a more or less indivisible and permanent investment. Once made it cannot readily be either decreased or abandoned or transferred from one section to another. The investment cannot in any great measure adjust itself to the use to be made of it. The loss of a few million tons of traffic finds the railroad with virtually the same costs, but with greatly diminished income. Bankruptcy, inferior service, or higher rates must result. Investments in water carriers are different. The number of boats in any service is adjustable to the need for them. Should the tonnage increase, the investment to carry it will be increased by diverting boats, already in use elsewhere, to that service. Should the need for boats in that service decrease, boats can be withdrawn and taken to other regions where the need for them is greater. Of course the owners would suffer financial loss during the time that it was being demonstrated that there were too many boats in that particular trade. But the point is that the loss would not be so sweeping as in the case of a railroad facing the same conditions. The gain of a few million tons by boats operating through the Canal would merely mean a flocking to that district of many boats already in service elsewhere. The loss of a few million tons need not mean bankruptcy for the shipping industry nor for individual owners, as it would in the case of loss of tonnage by a railroad, but a withdrawal of boats from that service.

As in the case of increases in Canal tolls, the proposal to grant relief has aroused bitter sectional strife, with the powerful Atlantic and tributary interests opposing and the great Middle

West and West, with the exception of jobbing interests in the intermountain region, favoring. So far, more pressure has been brought to prevent than to permit relief, but, if we have properly interpreted the importance of a well-balanced development of the country as a whole, it seems probable that some modification of the present policy of the Interstate Commerce Commission must be made, and some measure of relief granted.

GENERAL LOWERING OF RATES ON COMPETITIVE TRAFFIC

The third remedy which has been suggested is for the railroads to lower their rates, both at seaports and at intermediate points, to the level of water rates at the Pacific coast. Western railroad officials maintain that they cannot afford to make such blanket reductions, as they would lose more revenue on goods carried to intermediate points than they would gain on such traffic as they might recapture from water carriers. Others assert that competitive business at the Pacific coast is so important that, in order to secure it, the railroads will lower rates, both to the seacoast and to intermediate territory, when they have given up hope of relief under the Fourth Section.

The bills, officially designated Senate Bill 2327 of 1925 and Senate Bill 575 of 1926, were introduced by Senator Gooding of Idaho, to make illegal any further granting of relief under the Fourth Section. The chief proponents of the bills were owners of ships operating through the Canal, who expected to prevent a renewal of competition by railroads, and jobbers of the intermountain territory, who, if statements made by their spokesmen may be taken as evidence, hoped to force the railroads to extend water rates to the intermountain region in order to get a share of the competitive business at the coast.[24]

This explanation of the activity of the intermountain jobbers in behalf of the Gooding bills is supported by the fact that jobbers are interested principally in the relationship of rates. It makes less difference to them, as jobbers, whether rates are high or low, than whether there is a competitor who has a lower rate. Farmers, miners, lumbermen, manufacturers, and other producers, shipping to an established market, are more interested in

[24] *Report of House Hearings*, S.B. 2327 (1925), pp. 684, 686–87, 693.

the rate level, since freights are deducted from market prices to determine what shall be received by the producer for the product.[25]

Interests in the New England and Atlantic states, one witness explained, fought the Gooding bills because, among other reasons, they feared injury to the railroad industry upon which they must depend for transportation services. Coast jobbers, manufacturers, and agricultural producers, as well as lumbering, mining, and manufacturing interests of the intermountain section opposed the bills for the same reason. All Middle West interests fought the bills vigorously because of the belief that they would close the door to the only relief possible for them.

If the railroads in some manner could see their way clear to lower rates in accordance with the plan here suggested, intermountain jobbers would secure almost complete relief from the present oppressive competition of coast jobbers. Many other groups suffering from Canal competition would receive benefits similar to those which would be offered by one or both of the other remedies discussed. Pacific coast merchants would have, on equally advantageous terms, the markets of the Middle West and the Atlantic Coast. Trade with the Orient might be developed without hindrance. Middle West producers would be able to regain the markets which they lost when relief was suspended in 1918. Transcontinental railroads would secure much competitive traffic carried now by boats, though it is maintained that they would lose more revenue on goods carried at reduced rates to intermediate sections than they would gain from added business at coast points. It is doubtful therefore whether the railroads would secure adequate relief from a financial standpoint. It is probable that their relief would have to come in the form of increased rates on non-competitive traffic. Atlantic producers and merchants, the ships using the Canal, the railroads delivering competitive goods to Atlantic tidewater would all be injured in the same way that they would by Fourth Section relief.

While it is true that this remedy offers relief to the intermountain jobbers who probably can get relief in no other way,

[25] E. M. Antrim, *Report of Senate Hearings*, S.B. 575 (1926), p. 184.

and while it is true that it offers adequate relief to several other interests, it appears that it has a serious disadvantage in that it leaves the producing classes in danger of higher rates to their markets to make adequate returns for the investors in railroad securities. The proposal appears to "trade" the welfare of millions of producers for the welfare of a smaller number of jobbers whose functions are not so essential to the development of the West.

PROBLEM NOT SOLELY A RAILROAD PROBLEM

The problem of Canal competition is not, as many think, solely a railroad problem. Probably the railroads have less at stake than any other of the groups named, since the Transportation Act of 1920 requires the Interstate Commerce Commission to permit rates high enough to provide a fair return on the railroad investment. If the return on railroads of the West, as a whole, continues to be inadequate, rate increases on traffic that must depend solely upon the railroad must be allowed. The users of the service must pay the rates or be driven from the territory. At least it may be said that an effort must be made to pass the burden from the railroad investors to the producers and consumers dependent solely upon railway transportation.

The problem of loss of traffic and revenues by transcontinental railroads possibly can be solved through an increase in rates on such traffic as must of necessity continue to use railroad transportation, but the large number of other problems brought in by the Canal cannot be solved in this manner. Vital interests are affected, both public and private. People of the West and Middle West are entitled to reasonable protection from unnecessary injury by Canal competition. The people of the United States as a whole are entitled to a policy on the part of the government which will make available every necessary agency for defense in case of war. An increase in Canal tolls and a restoration of relief under the Fourth Section appear to promise the most satisfactory solution possible under present circumstances.

CALVIN CRUMBAKER

THE BANK ACCEPTANCE AND LETTER OF CREDIT IN SHORT-TERM FINANCE

I. INTRODUCTORY STATEMENT

AN ARTICLE by K. N. Llewellyn analyzing *Some Advantages of Letters of Credit* appeared in this magazine in January, 1929.[1] Mr. Llewellyn referred primarily to irrevocable commercial letters of credit under which bank acceptances are drawn to finance foreign and domestic trade. Traveler's letters of credit were not referred to and revocable commercial letters of credit were given little consideration.

Mr. Llewellyn appears to argue for more general use of the irrevocable commercial letter of credit in domestic as well as in foreign trade finance. He seems to have overlooked several important considerations in his fervor to advance the cause of the favored document. He seems, for one thing, to be quite in ignorance of the fact that, even in foreign trade, most bank acceptances do not arise under letters of credit.[2] The letter of credit is a necessary step in the process only when the buyer, importer or consignee initiates the bank acceptance credit. It is not used when the seller, exporter, storer, or consignor draws a draft on his bank under an acceptance credit agreement, and this is the more usual procedure.

The oversight is important. If there are decided limits to more general use of bank acceptances, these limits will restrict more general use of the letter of credit. Further, limitations to the general use of the bank acceptance may be augmented by limitations which make it difficult for the buyer, importer, etc., to initiate the acceptance by obtaining a letter of credit. Thus, Mr. Llewellyn's analysis seems to lack perspective; lack of perspective makes for disproportion. More particularly, the values of the letter of credit are overstated; its limitations appear to be minor in character or to be non-existent.

[1] Cf. *Journal of Business of the University of Chicago*, II, No. 1, 1–16.

[2] Cf. Edwards, *International Trade Finance*, p. 373.

The present writer desires to give due weight to some of the more important limitations to general use of the letter of credit. To accomplish this purpose, he proposes: (*a*) to discuss the limitations facing general use of the bank acceptance in business finance since these limitations will also stand in the way of general use of the letter of credit; (*b*) to consider the factors which tend to prevent the buyer, importer, etc., from originating the acceptance credit by obtaining a letter of credit.[3]

The advantages and limitations of the bank acceptance as a financing device are treated in more or less detail in several books.[4] Federal Reserve law and regulations, banking and business practices are considered as they facilitate or retard acceptance financing.

Restatement herein of the Federal Reserve regulations[5] concerning bank acceptances will be limited to a summary of the more important rules which are pertinent to the discussion. This seems justified as many readers of this magazine cannot be expected to be familiar with the literature of banking. Mr. Llewellyn himself appears to have quite overlooked the importance of banking law and regulation in delimiting the area of employment of the letter of credit.

Business and banking practices and relationships limiting the use of the bank acceptance and letter of credit, will receive detailed consideration. Available literature deals too scantily with these factors; the interrelations between banking regulations, and business and banking practices and situations are not adequately discussed.[6] And, finally, for the sake of reasonable completeness, the principles of business finance must be consid-

[3] Mr. Llewellyn's article is quoted from time to time and some of the discussion centers about these quotations. The purpose is not to criticize adversely, however, so much as it is to supplement Mr. Llewellyn's analysis.

[4] Willis and Steiner, *Federal Reserve Banking Practice,* chaps. xv and xix; Willis, *The Federal Reserve System;* Reed, *Federal Reserve Policy,* chaps. viii–ix; Edwards, *International Trade Finance,* chaps. x, xii, xiii, xiv.

[5] The word "regulations" refers to the provisions of the Federal Reserve Act and to the regulations of the Federal Reserve Board.

[6] No adverse criticism is intended. The books are concerned primarily with banking history and theory rather than with banking and business practice, except for Dr. Edward's book, which does not deal with domestic finance.

ered in their relationships to the general use of bank acceptances and letters of credit.

II. FOREIGN TRADE FINANCING AND BANK ACCEPTANCES

The Federal Reserve Act and the regulations of the Federal Reserve Board define the acceptance powers of member banks;[7] state the guiding rules determining eligibility of bank drafts for member bank acceptance, for rediscount and open market purchase by Federal Reserve banks; lay down the principles to be applied in creating and managing bank acceptance credits.[8]

Certain of the more important regulations concerning bank acceptances in foreign trade finance may be summarized and their significance for our purposes briefly noted:

1. Drafts are eligible for acceptance by member banks if used to finance not only the domestic production, storage, and movement of goods into and out of the United States but also storage within and shipments between foreign countries. The goods must be intended for foreign trade but need not be actually shipped or ready to ship. The sale need not be fully consummated nor the goods identifiable when the acceptance is made. There must, however, be an order or a contract to export or import. The draft must directly "grow out" of a foreign-trade transaction.[9] Thus, the exporting manufacturer who produces "for stock" and not "on order" must finance purchases and production of exports by other than a bank acceptance.[10]

Acceptances to finance storage of readily marketable staples in foreign countries, must be secured at time of acceptance and (to be eligible for rediscount), throughout the life of the acceptance by documents of security title to the staples stored. A trust receipt is adequate security, provided that release of goods under the receipt is conditioned upon a reasonably prompt liquidation

[7] Acceptances to create dollar exchange are not discussed in this article.

[8] Cf., Willis and Steiner, *op. cit.*, pp. 464–65. The Board has attempted to follow the apparently most conservative foreign practice in regulating acceptance usage.

[9] Documents of title to goods need not accompany the draft at time of acceptance. This adds to convenience in using the acceptance.

[10] Domestic uses of the bank acceptance are discussed later on in the article.

of the credit. Storage acceptances are supposed to permit only temporary holding of staples; they are not to be used to finance production or to supply general working capital. Long-term, speculative storage transactions are deprecated.[11]

2. Acceptances are limited to six months maturity. But the maturity should not exceed the period usually required to dispose of the underlying goods. General working capital should not be obtained by use of acceptances; "continuous financing" is deprecated; acceptance credits should not be used to enable firms to finance the foreign business of their customers or to extend open account credits to them.[12]

Trade terms[13] in excess of maturity limits set by the Federal Reserve Act and regulations or by foreign banking practices[14] may be necessary in some cases but they may make acceptances too costly by necessitating "refinancing." On the other hand, cash terms or very short terms may not justify any financing, particularly if the seller or buyer is "flush." The tendency to tie acceptances to specific transactions does not in practice prevent acceptance financing of a series of continuous exports and imports. But while renewal bank acceptances are not impossible to obtain, such drafts are subject to close scrutiny by the banks.

The need for long credits or continuous financing suggests consideration of the relative cost and greater safety and certainty of various methods of long-time financing, but of this more will be said later on.

3. The 10 per cent limit applies to acceptances for one interest unless the acceptor is fully secured. An ordinary trust receipt is not considered actual security but a trust receipt which gives

[11] Cf. *Federal Reserve Bulletin*, January, 1928, p. 66, Section XI. Maturity regulations, uncertainties attending use of renewal drafts, provisions concerning documents of title help to insure temporary storage only.

[12] Willis and Steiner, *op. cit.*, pp. 568–70.

[13] Length of transportation periods, capital scarcity, the kind of product, economic status of customers, general business or local conditions are related to the credit terms.

[14] The foreign exporter drawing a draft on his bank may find that maturities are limited by foreign banking regulations and practices.

the customer no access to or control over the goods is considered actual security.[15]

There will be cases where paper other than the acceptance will be used to avoid the "actual security" limitation of the 10 per cent rule.[16] This will obviate the need for refinancing of "excess" bank acceptances when goods are withdrawn for processing or when, for other reasons, actual security cannot be pledged with the bank upon withdrawal of goods. In such cases, the risks of financing by use of trade paper is perhaps somewhat less than when bank acceptances are used. Trade paper is not likely to be so difficult to deal with when release of documents, renewal, or extension is needed.

4. The regulation recognizing trade drafts as actual security for acceptances in excess of the 10 per cent limit on unsecured loans has helped to overcome the difficulties of refinancing "excess" acceptances, save for storage transactions. Thus the exporter may easily finance by a bank acceptance securing this paper by a trade draft on the importer when the importer is unable to obtain a letter of credit on account of inadequate banking facilities or inferior credit standing or when competitive conditions or well-established trade relations make inexpedient a request for a letter of credit.

That one bank may refinance discounted trade drafts by drawing a draft on a member bank has also tended to increase acceptance financing. Foreign banks may thus tap the money market of the United States for funds to carry their customer's foreign trade transactions.[17]

5. Regulations concerning eligibility of bank acceptances for rediscount and open market purchase by Reserve Banks emphasize limited maturities. Emphasis is also placed on the principle of self-liquidation. Acceptances are supposed to be tied to specific, self-liquidating transactions.

[15] This recognizes the uncertain legal status of the trust receipt.

[16] Drafts or bills of exchange drawn in good faith against actual existing values, commercial or business paper actually owned by the interest negotiating same are not subject to the 10 per cent rule (limiting loans to one interest) of Section 5200 of the National Banking Laws. There are certain limitations concerning maturity and other matters.

[17] *Federal Reserve Bulletin*, December, 1926, pp. 845–55.

It is clear that banking regulation and practice do not seriously limit acceptance financing of foreign trade. Limitations arise out of other factors. There is, first, the factor of the cost of financing. The net cost of acceptance financing is not necessarily below that of financing by other methods.[18] The acceptance commission ranges from 1 to 1½ per cent per annum. This must be added to the discount rate when the drawer has to pay both, which is not infrequent in periods of keen competition for sales. Thus with 90-day bank acceptance discount rates in New York at 5 per cent (as of January 30, 1929), the net cost to the drawer may be at the rate of 6 to 6½ per cent per annum. Commercial paper rates in New York, as of the same date, were 5½ per cent. The ¼ per cent "flat" commission added to this rate would make the net rate on commercial paper around 6 per cent for six months maturities. Rates on customers' loans at the same time were around 5.53 per cent, the deposit balance requirement being disregarded. Since open bank lines are usually needed to sell commercial paper or use acceptance credits, bank balances are more or less common to all three methods.

In times of easier money, all the rates would be lower but the difference between commercial paper and acceptance rates may favor commercial paper. As compared with customer loans, acceptances might be less costly in periods of very easy money but the difference would often not be important enough to offset such considerations as risk in refinancing,[19] inconvenience, and other matters later mentioned. More general use of bank acceptances would, as later indicated, tend to eliminate any spread between acceptance and other short loan rates.[20]

Geographical differences in interest rates might encourage concerns located away from money centers or in centers where rates were relatively high to use bank acceptances in order to gain the benefits of the lower rates quoted elsewhere. Should the practice become general, however, the rate differences would tend

[18] This discussion applies to the later section on domestic financing by bank acceptances, as well as to the present section.

[19] The additional commission to refinance might eliminate net cost differences.

[20] See p. 193.

to disappear so far as they reflect geographical differences and not differences in credit risks.[21]

But what if the buyer rather than the seller must pay the costs of financing? Does the seller thus escape costs which he would have to pay if trade paper were used? It must be remembered that the seller is also a buyer. If, as seller, he passes on the costs of bank acceptance financing to his customers, will not the concerns from which he buys pass on acceptance costs to him? Since the value of what he buys may be less than values sold, he may pass on more than is passed to him, given credit terms of approximately the same length. But terms of purchase may be longer than terms of sale and the net result be either for or against the seller as a buyer.

All this assumes that financing requirements for short-term funds are a function of merchandise sales and purchases. It happens that, in practice, cash budgets and financing programs must also consider cash needs for wages, salaries, other services, and, to some extent, for plant and equipment. Financing requirements for short-term loans, therefore, will be often far from adequately cared for by use of bank acceptances. This will be particularly true if reliance is placed on acceptances arising out of exports, imports, and foreign storage of goods. Thus total short-term financing costs will exceed costs to finance foreign trade business. Much of this total cannot, therefore, be directly passed on to customers.

The exporter's ability to pass all costs, including financing costs, on to the importer is not a function of the bank acceptance method of financing. Sales prices can include taxes and interest on trade drafts as well as taxes, discount and/or commission on bank acceptances. Interest on open account sales can be added to the net sales price. But sales prices are the result of the interaction of numerous market forces, a minor one being financing methods and costs. The writer knows of no evidence indicating that sales prices vary with financing methods and costs.

Second, we must consider the type of transaction to be

[21] A case where the individual may gain at the expense of the ignorance or inertia of the group.

financed. This is important in relation to the risk of financing as well as to the cost. "Continuous imports and exports" are not approved by bankers as a desirable basis for bank acceptance credits; foreign storage, purchases, and sales requiring credits extending beyond six months are even less in favor. Thus permanent financing to care for such requirements is often desirable because less uncertain, with respect to renewals and refinancing, than temporary credits.

Since 1924, industrial stocks have soared to new high levels for all time. The fifty industrial stocks used by the Standard Statistics Corporation in its index of stock yields, showed a yield for the first half of January, 1929, equal to 70 per cent of the rate on bank acceptances at New York, to 37 per cent of the rate on call loans at New York, 61.72, 61 and 61 per cent respectively of the yields on 20 high-grade preferred stocks, 60 high-grade bonds, and 60–90 day commercial paper at New York.

Thus many concerns actually cannot afford to borrow for permanent requirements. The most profitable way of "trading on the equity" for these firms is by increasing the equity itself through issues of common stock and by avoiding the use of short-term financing save for temporary requirements.[22] The bank acceptance could be used, if inexpensive as compared with other methods, for such temporary foreign transactions as bankers consider suitable.

But limitations of cost and of the type of transaction do not complete the list. Inadequate banking facilities may limit the use of bank acceptances by either or both parties to the foreign trade transaction. Sales to branch houses and agents, on trade draft, works well in many cases. The net cost is not much, if any in excess of that of the acceptance but the trade draft arrangements are much more elastic. Open account sales are not financed by bank acceptances. The arrangements are such that documents of title are not readily retained by the exporter or his bank and open accounts are not regarded as satisfactory collat-

[22] The United States Steel Corporation and the Anaconda Copper Mining Company are to retire large bond issues by sale of capital stock. The saving appears to be considerable in the case of "Steel" at least.

eral in banking circles. Yet the established arrangements between exporter and importer work satisfactorily. Changes will come slowly and if, as, and when feasible.

So much for the general limitations of the bank acceptance in foreign trade financing. Let us now ask what factors limit the practice of having the buyer (importer) or consignee originate the bank acceptance credit by obtaining a letter of credit for benefit of the seller, exporter, or consignor.

Mr. Llewellyn argues that the letter of credit passes the burden of the credit risk to the buyer's bank. This is desirable not only because of the frequent inadequacy of credit data on foreign risks[23] but also because the buyer's local banker is a better judge than the seller of the buyer's credit and of local conditions affecting the credit. The banker is less likely to permit the buyer to "overbuy" because the banker has no "sales bias." If the exporter draws against a bank acceptance credit of his own initiating, he takes all the risks he would take if he merely discounted a trade draft. His only gain is in a lower cost of financing—if there is such a gain—and so in lowered sales resistance if financing costs are directly passed on to the importer.[24]

Changes in styles and prices, physical deterioration of goods, foreign exchange fluctuations, fraud, and sharp practices on the part of the importer are risks that must be assumed by the exporter if he is liable to the accepting bank. These risks may be passed on to the importer in whole or part if the letter of credit is employed.[25]

In practice, however, exporters often require a down pay-

[23] This is often exaggerated as noted by Edwards, "Financing Agricultural Exports from the United States," *United States Department of Commerce Trade Information Bulletin,* No. 241, pp. 6–12.

[24] Foreign money markets might be utilized when interest rates in the exporter's country were relatively high, by having the importer obtain a letter of credit. The savings in financing costs accruing to the importer might be used as an argument for the letter of credit. The foreign exchange acceptance could be sold for future delivery at the time the order is placed.

[25] Under a letter of credit, the exporter may secure confirmation of a domestic bank thus placing two bank names in back of the risk. Confirmation costs, however, lessen any cost advantages of the letter of credit bank acceptance method.

ment of from 15 to 25 per cent of the c.i.f. price of the goods. The importer remits this sum in the form of a demand draft. Thus the importer assumes some of the risks. The more even division of risks as between importer and exporter reduces the need for a letter of credit. Long-established relations between exporter and importer may militate against the use of the bank acceptance.[26] The credit risk may be negligible and thus offer little inducement to use a letter of credit. The seller's bank may be willing to take trade drafts at a net cost no greater than that of the bank acceptance.[27]

Exporters are becoming more and more effective in obtaining credit data and in analyzing the credit risk. The development of credit data gathering agencies, trade associations, international banking relationships, points to steady progress in gathering, coordinating, and disseminating more complete, accurate, definite credit information and also in improving credit analysis and practices. All this reduces the cost and risk of selling or buying "abroad" and lessens need for letters of credit. Further, much of the cost of a credit department is, within limits of capacity, overhead expense; it decreases per unit of credit work as the volume of work increases. Thus the cost and risk of assuming the "credit strain" may become less than the cost and risk of attempting to force changes in competitive practices of financing, e.g., to introduce shorter sales terms[28] or to insist that the importer furnish letters of credit.

And what, of the importer's credit standing?[29] Bankers do not grant letters of credit to concerns which cannot get loans.

[26] Edwards states that tobacco exports are established on an "honor basis." *International Trade Finance*, p. 183. It would be of doubtful expediency to insist on letters of credit in such cases.

[27] Inadequate banking facilities may prevent the importer from obtaining a letter of credit. Over a period, the significance of this limitation usually tends to disappear.

[28] In order to bring acceptance maturities within the limits set by current banking practice and regulation, the importer might need to refinance a letter of credit acceptance arrangement thus lessening the value thereof.

[29] Whether the importer's banker is normally the one best able to measure the importer's credit is an issue for later discussion.

Many transactions are thus, from a credit point of view, outside the scope of letter of credit bank acceptance arrangements. Nevertheless, the exporter may be wise in financing inferior risks because his profit margin justifies a risk the banker cannot afford to take in view of *his* profit margin. Were such risks to be assumed by bankers, the cost of acceptance financing would be increased considerably.

Some risks can obtain secured loans when unsecured ones would be refused. These firms can obtain letters of credit for benefit of exporters when the accepting bank can retain a valid lien on the goods. But importers of this class may often find it very necessary to secure release of goods under conditions which do not allow the acceptor satisfactory collateral security during the life of the acceptance. This lessens the value of the method to such importers.[30]

The tendency toward greater use of the bank acceptance in foreign trade is the outstanding development of this device since 1921. There seems no reason to emphasize the values of the bank acceptance and letter of credit for foreign trade financing. They are finding their place rapidly enough. The limitations will serve to slow down the rate of increase in the use of these documents and to fix their ultimate "sphere of influence."

III. DOMESTIC FINANCING BY BANK ACCEPTANCES

The possibilities for general use of the bank acceptance in financing domestic business are much more limited than in the case of foreign trade transactions.[31] The Federal Reserve Act and the regulations of the Reserve Board are rather restrictive and conservative in guiding domestic financing by bank acceptance; more so than in the case of foreign trade transactions.

1. Acceptances for domestic purposes may be issued to finance shipment of any product and to finance the storage of

[30] The business and social justification for carrying inferior credit risks is discussed later on.

[31] The normal pre-war acceptance liabilities of the English joint-stock banks are said to have been around 50 per cent of their capital stock and surplus. Cf. Willis and Steiner, *op. cit.*, p. 472. Acceptance houses added considerably to the available supply of acceptance credits. Even in Europe bankers' acceptances are usually used to finance foreign rather than domestic trade.

readily marketable staples only.[32] At time of acceptance, drafts to finance domestic trade must be secured by attached documents of title or some other actual security growing out of the same transaction as the acceptance.[33] Emphasis is placed on the temporary, commercial character of the acceptance. It must be tied to a specific, self-liquidating transaction; it is not to be used to furnish general working or fixed capital; it is to be liquidated out of the proceeds of the goods to finance normal shipment, sale, or storage of which the credit was intended.[34] Continuous financing is discouraged.

2. Regulations concerning the maturities of domestic acceptances, the 10 per cent rule and other matters are similar to the regulations governing foreign trade transactions.

Whether or not these principles be sound, they are the ones guiding banking practice. They seem quite likely to persist. But they very definitely limit the use of bank acceptances in domestic finance. Thus concerns cannot finance manufacturing operations by bank acceptances. For example, the Federal Reserve Board has ruled ineligible for acceptance and rediscount a draft drawn by a packer on his bank for hides shipped to a tanner for processing on a commission basis.[35]

Then there are cases of this sort: some corporations have a relatively long production period as compared with the credit terms quoted to customers. The requirements of these firms for short-term loans are, on the average, much larger than their sales credits or receivables. The bank acceptance would not provide sufficient funds for even temporary financing requirements.

Many concerns borrow from banks on "straight" notes year

[32] Goods of this latter category must be durable, generally produced, and well established in commerce; they must have a ready and a wide market.

[33] Accommodation acceptances are not lawful, i.e., acceptances for a drawer not directly connected with a specific transaction or not to finance a specific transaction. Note unfortunate use of the term "accommodation" by Mr. Llewellyn, *op. cit.*, p. 1.

[34] Long-term, speculative storage operations are disapproved. Goods must be stored in an "independent warehouse." The acceptance must remain fully secured during its life. Goods may be withdrawn only upon reasonably prompt liquidation of the credit.

[35] *Federal Reserve Bulletin*, 1921, p. 1,312.

in and year out. The funds are used to finance production, inventory, sales, credits extended to customers, minor additions to and replacements of fixed assets.[36] This admittedly permanent borrowing would not be regarded by banks as legitimate if carried on by means of bank acceptances. Nor would the acceptance be the convenient, elastic device desired by such concerns. Since acceptances would be based on the general credit of the business, net cost might be the same as for the usual bank loans.

And yet some permanent short-term borrowing seems necessary. The gradual expansion of a business cannot be economically financed by long-term security issues until the business knows the expansion is permanent and until the funds required amount to a total large enough to permit ready access to the investment market.

The safety of such borrowing is very frequently not questioned by any banker. The strongest concerns resort to the practice. The loans are "paid off" by rotation of bank borrowings.[37] The paper is liquid even in a period of credit stringency, if it can be shifted. It will be shiftable if it is safe and if the Reserve Banks are able and willing to take it by rediscount.

Permanent fixed and working capital needs have been successfully financed[38] by bank credit during periods of waiting for long-term interest rates or stock yields to decline to a point permitting more economical long-term financing. Such a use of bank acceptances would be very dubious, if possible, under present banking regulation and practice. The direct bank loan is less hemmed in by rules and principles, more easily renewed and refunded.

Again, concerns shipping to agents or branches would find the bank acceptance of little use to them in domestic trade. The drafts would have to be refinanced at the close of the period of

[36] See also p. 183 of this article for further discussion of factors determining needs for short-term financing.

[37] By proper distribution of bank lines and rotation of loans, the "cheapest" money markets can be tapped thus obtaining one of the benefits of acceptance financing.

[38] General practice of this is not urged. The wisdom of the procedure depends entirely on the facts of the given case.

shipment if the agent's or branch inventory was to be "carried" during the usual turnover period.[39] Buyers who were well-established customers might object to the red-tape and delay incident to securing bills of lading from local banks acting as agents for the seller's bank when the seller arranges the acceptance credit. The Federal Reserve Board has ruled that a buyer who draws a draft on his bank, bill of lading attached, is asking for an ineligible acceptance. There is not that "direct connection" between the goods shipped and the draft contemplated by banking law and regulation.

While, after acceptance by the drawee bank, the bill of lading may be released for direct mailing to the buyer, this would leave the accepting bank and the seller unsecured during the entire life of the draft. Thus any values to be gained by use of the acceptance would be those of savings in financing costs or those arising from having the buyer's bank measure the credit and originate the acceptance under a letter of credit. The cost of financing by acceptances has already been discussed.[40] The relative effectiveness of the seller and buyer's bank in measuring credits is a matter for later analysis. The time, red-tape and inconvenience of obtaining a letter of credit might well prejudice buyers. They might object to paying the acceptance commission, particularly if prices now quoted do not include financing charges as separate items.

The production, shipment, and sale of "services" cannot be financed by acceptance credits. Shipment periods for goods of thirty days and less (and this is frequent), shipment periods exceeding six months[41] do not make acceptance financing expedient or economical. This is particularly true when short shipments combine with cash or cash discount terms. Very long and uncer-

[39] Thus, shipment to an agent of the shipper may be financed by an acceptance whose duration should not exceed the period of transit of the goods. Acceptances to finance shipment of goods sold may extend beyond the transit period to cover usual credit terms but not to exceed six months.

[40] The cost of using the acceptance as affected by general use of the device, is discussed again on p. 193. Earlier discussion appears on p. 182.

[41] Nine months for agricultural products. Such periods are probably hypothetical for practical purposes.

tain credit terms, terms to inferior credit risks might call for a refinancing of acceptances, adding to costs and inconvenience.

Instalment sales and retail credit sales as a class are not suitable to acceptance financing. This statement also applies to many wholesale sales. There are often many difficulties in measuring consumer and retailer credits. Credit periods are frequently long or very short or indefinite. Many credit risks are of inferior quality. Retail and instalment sales usually lack the "self-liquidation" characteristic so highly prized by bankers. Such factors as small orders and frequent re-orders run up clerical costs of handling acceptances. Small transactions do not produce acceptances of denominations likely to find favor in the general market. Acceptors purchasing their own acceptances are considered to be making loans to the discounting concerns. Such loans would reduce the latter's credit lines.[43] Any advantages to be gained by using the acceptance in such cases would be: (*a*) in lowered costs of financing; and (*b*) in having the buyer's credit measured by his bank, this involving issue of the acceptance under a letter of credit. These matters are considered later on.[44]

The terms of domestic commercial credit now in use still further limit the field of the bank acceptance. Terms of credit are predominantly cash discount terms. There are, of course, some industries selling on net terms, no cash discounts being offered.[45] Very short net terms, as for fresh meats, do not require any financing by such a device as the bank acceptance. And, of a certainty, the accounts of a slow and doubtful character now carried in such industries would not be suitable for an acceptance. Such accounts could not obtain letters of credit. The transactions would not produce drafts eligible for acceptance or rediscount. The accounts are often very small, have indefinite maturity and often remain in existence long after the goods have been sold.

[43] The 10 per cent rule applies to acceptances so purchased. Principles of acceptance usage do not favor a bank's purchase of its own acceptances as this does not help develop an open market.

[44] See also p. 182.

[45] Cf. W. H. Steiner, *The Mechanism of Commercial Credit.*

Very long net terms may not lend themselves to the bank acceptance. Maturity limitations restrict its use and increase its cost. The frequent necessity for financing the processing of goods calls for other means of raising funds. The need to store for long periods complicates attempts to arrange eligible acceptance credits. Here, too, the doubtful risks among buyers would often be unable to obtain letters of credit.

Cash discount terms vary in length, amount of discount, practices in enforcing credit terms. Thirty-day net terms with discounts for cash within ten days from date of the sales invoice, may be selected as typical of our cash discount terms. How could the bank acceptance fit into domestic, industrial, and commercial financing practices when these terms are quoted?[46]

To finance the buyer through the usual credit period, acceptances would be of little value under cash discount terms. The better accounts take their cash discounts, thus removing the need for any financing. Many of the less desirable accounts may not be good enough risks to obtain letters of credit. The seller might hesitate to initiate the acceptance credit because of the more convenient, elastic, and, perhaps, no less costly, no more risky method of financing the buyer through bank loans or on permanent capital.

Should we argue for abandonment of the cash discount? Should all lines of business quote net terms only and sell on bank acceptances? This would not "prevent" open account, promissory note financing[47] but it might enable more general use of bank acceptances. The present system has at least the advantage of being elastic. Credit terms may be varied to suit the varying

[46] Granting that difficulties due to size of orders, frequent reorders, etc., are eliminated. Assuming sales of goods to manufacturers and wholesalers and not merely shipments to agents or sales to consumer.

[47] The basic issue here raised is the same as that for the general use of the trade acceptance. The case for that device failed to get far. The cash discount persists by the power of competitive forces. Its advantages are worth considering. They appear to have outweighed its limitations. The net result of "all the shootin'" has been to assign the trade acceptance to limited use for long terms of credit in certain lines of business or, in other lines, as a collection device. Steiner, *op. cit.*, gives a very detailed analysis of the trade acceptance movement including a discussion of the value and limitations of the cash discount system.

conditions prevalent in an industry and between industries. At least no competitive resistance must be fought to revolutionize terms.

The general use of bank acceptances under a net terms system would mean no longer terms of credit to the now "discounting" buyers for they can get bank loans as a rule; for sellers it would mean increased credit risks and larger needs for bank credits, unless letters of credit preceded the issue of acceptances.

But what gains do we derive by general use of the acceptance under a net terms system of credit? Would sellers save all or part of the cash discount? Would prices be lower by the amount of the saving? The causal relations between discounts and prices are too vague to justify an answer. Would prices be any lower in a seller's market? What of prices in a buyer's market? Discounts and financing costs are probably minor forces in determining sales prices.

Could acceptance financing costs be passed on to the buyer regardless of market conditions? Is it true that current financing costs cannot now be passed on to the buyer when competition permits? It is doubted that financing costs would be any lower if acceptances were in general use or "if the letter of credit becomes the credit system."[48] It has been stated earlier that, in the particular case, the costs of acceptance financing may offer no advantages.[49]

Credit prices—net discount and interest costs—depend primarily upon the relations between the supply of and demand for credit. Assuming that bank reserve ratios remain constant, a shift of demand from one group of credit instruments (open accounts, promissory notes) to another (bank acceptances) merely tends to raise the cost of using the second and reduce that of using the first. One difficulty encountered in developing an open market for bank acceptances is that the discount rates on this class of paper have been too low to encourage general purchasing by the banks.[50] A larger supply of bills would merely raise the

[48] Cf. Llewellyn, *op. cit.*, p. 14, line 7. [49] See p. 182.

[50] Cf., Quotations from Dr. Burgess' address before the American Acceptance Council, National City Bank of New York, *Bulletin on Economic Conditions*, February, 1929, pp. 26–27.

rate to enable acceptances to compete more successfully with commercial paper, bonds, and call money. This would probably eliminate any cost advantages of using acceptances generally.

Mr. Llewellyn suggests that a more general use of "letters of credit as a means of originating bank acceptances" would make for sounder credit extension to buyers by "placing the incident of the credit risk further down the line," i.e., on the buyer's bank which would issue the letter of credit. He further states: "the argument means in brutal result less business, if the letter of credit becomes the credit system. But the business which is eliminated is precisely that which has no business being."[51] And again, "the profit (of the seller) lies in merchandising, not in credit giving. Indeed the latter is more than likely to figure as a source of losses."[52] The idea seems to be that the seller is not a credit man, that the buyer's bank is a better one, that the seller should merchandise, and that the banker measure credits and carry them.

At present the "bankable" risks discount bills and borrow from their banks.[53] Would their banks be better appraisers of credit under a letter of credit system than under that prevailing? How so, if the only change is from one credit instrument (the promissory note) to another (the letter of credit bank acceptance)? The buyer's banker would have to base the issue of letters of credit upon the general credit of the buyer, as he does now. Liquidation of the credit would depend upon the buyer's ability to sell and collect, as is true now. The buyer's ability to sell and collect would be subject, as now, to all the risks of local, national, or inter-national market-price[54] changes, style changes, "buyer's strikes," etc. Since acceptance financing would probably not extend beyond the wholesale stage, the consumer and

[51] *Op. cit.*, p. 14.

[52] *Ibid.*, p. 13.

[53] The "local" banker measures the credit. The credit risk is negligible for the seller.

[54] A buyer's local bank may be a better judge of local conditions than a seller or his bank but a local market concentrates market risks while a wide market spreads them but lessens the advantage of the buyer's bank over the seller and his bank, in measuring the buyer's credit.

retailer could not liquidate wholesale or retail purchases by paying by means of acceptances and letters of credit.

But wouldn't the buyer's bank extend credit only to finance self-liquidating transactions whereas, at present, lines of credit are based upon the general financial condition of the borrower? Other questions point to the answer. Is the specific transaction as safe a basis for a credit as a series of them reflected by general financial standing? Is it better to depend on one potential event or on a series of them, in assuming a credit risk?[55] A transaction is liquid *in futuro* only. Liquidation depends on how well the buyer, as a seller, solves the problems of business risk-bearing. Bank acceptances, in the last analysis, represent credits for mercantile and manufacturing risks. In general and to the accepting bank, they are no better than the financial condition of the underlying risk. This, perhaps, helps to account for the differences between open market rates on bank acceptances and net costs of acceptance financing, i.e., discount rates plus commission.

But what of the risks on the margin? Those just "bankable" or those which are now "bankable" and then not "bankable?" Surely the local banker rather than the seller and his bank should measure the credit. And so financing by the letter of credit bank acceptance would greatly reduce the seller's risk.

Other things being equal, this argument has much weight. But it also has its limitations. Credit data can often be obtained and analyzed, and the risk very accurately rated by the seller. A financially strong seller is as well, if not better, equipped to do credit work as a small, "local" banker. The buyer may sell in international markets so that local conditions are relatively of less credit significance than conditions in a particular industry. Of the latter, the seller may be fully as good a judge as the buyer's banker. The reverse of these assumptions may also be true in given situations. To say that "normally" the banker is the better credit judge of the two is to set up a standard that, if it exists, is

[55] The law of averages testifies to the value of spreading one's risks. In effect, this challenges the banking regulations surrounding acceptance usage. Nevertheless, the regulations will continue to stand if present indications be not faulty.

not capable of proof. In business, conditions vary too greatly to make such a "norm" a safe one in determining business policy.

Again, the buyer may have many bank lines. Which bank is to measure the credit? The one most eager to get the loans and deposits? How much better a judge of the risk is he than the seller? How eager to meet the buyer's desires as influenced by his own or the seller's "sales bias"? Is it safe to assume that "buyers" do not try to exercise judgment in buying, producing, credit granting in order to preserve solvency and make profits? The buyers who exercise the poorest judgment are likely to be the ones most in need of a banker's controlling hand. But are they also not likely to be the "non-bankable" risks? One might argue that the way to shift the "bankable" risks to their banks, under net terms, is to adopt the cash discount. This writer believes that a fair case could be made for the change. The appeal to the buyer's profit motive would probably be rather effective. Credit risks would thus be largely shifted to the buyer. The use of a cash discount is, however, often inexpedient.

The "non-bankable" risks will continue to be carried by the seller[56] and his bank. There are good reasons for this from the point of view of seller and society. The buyer's banker may be superior to the seller in judging a "bankable" risk. But the banker is not necessarily a good judge of the risks a seller can afford to take. The seller's justifications for carrying "non-bankable" risks lies in the profit derived from merchandising to these risks. You cannot in practice separate the credit and merchandising functions.

Failure to sell to the non-bankable risks would often reduce sales volume, capital turnover and increase overhead expense ratios to sales thus bringing decreased earning power to total capital and net worth. The direct and indirect profit obtained by selling to the inferior risks usually amply compensates the seller.[57] Bankers get a rate of return which forces them to accom-

[56] The stronger risk now tends to go to the bank. This is desirable for the bankers and the credit system.

[57] The "credit strain" is easily exaggerated. It is often as burdensome as "the gentle dew that falls."

modate only the better grades of credit risk. Practically speaking, a letter of credit system would effect no change in the *status quo* for "non-bankable" risks.

In these days of specialization, it does not follow that a merchandising concern cannot successfully handle the non-bankable or mediocre credits. Too many of them do, to justify the statement that credit granting is not the business of the merchandiser. What is needed is that credit specialists measure credits in the light of the conditions and policies of the given business. Credit extension may be further safeguarded by removing the credit and collection activities from the jurisdiction of the sales department and subjecting them to the control of the financial executive. The latter method of organization is very common.

From the social point of view, just because a business does not merit a letter of credit or a bank loan does not mean it "should" not be allowed to be. A young business may be efficient but too new to appeal to banking conservatism. A business may be thoroughly worth saving and yet temporarily in poor financial condition. It may be efficient in sales and production but its management may be inexperienced in finance and in need of advice. Or it may be the sales function that needs some assistance, and so on.

If the social values of free competition and individual enterprise for profit are to be retained, it is necessary to allow such enterprises to "try their luck." Since we cannot spot the failures in advance, the losses of carrying them are costs of uncertainty. We hope we have a net gain from the units that "pull through" and become "bankable" risks.

But the letter of credit as a device for reducing credit risks has very broad social significance for the control of credit flow, it is alleged. In this connection, Mr. Llewellyn argues for the general use[58] of the letter of credit as follows:[59]

> On the other hand, trade acceptance, ordinary open account[60] . . . . are all alike in financing from the seller's end. On the seller rests the pri-

[58] The very great difficulties attending attempts to obtain general use of this device have been discussed. The points here at issue are concerned with the argument that general use, if this were possible, would eliminate credit stringency.

[59] *Ibid.*, pp. 11–12. [60] Other devices now used are mentioned.

mary credit strain.[61] His credit standing is the primary measure of the banker's loans.

From which flow consequences. The paper commands a rate of discount which reflects mercantile, not banking risks; it is, relatively, an expensive form of credit.[62] And for a reason. Its payment is subject to all the contingencies of unknown, distant buyers. Let the market break, and the buyers' failure to resell means their failure to pay; their failure to pay means that the seller fails to meet his obligations—and so on back. . . . . The credit stringency rolls up; each insolvency threatens to bring on others. . . . .

Now let us view the situation as it might be if "the letter of credit becomes the credit system." To quote Mr. Llewellyn[63] again:

Contrast the situation under the letter of credit. Let the market break; the only parties involved will normally be the buyer and the buyer's bank. All sellers back of the transaction out of which the banker's credit originates will get the benefit of liquidation; the stringency does not roll up; indeed, there is a needed and welcome period of easing off which makes contraction of current finance a possibility. And between the seller (and those who sold to him) and the possibility of trouble stand the financial resources, not of a buyer[64] who is dependent on the market in a single field,[65] but of a banker whose interests are more varied, and who may be hoped, by temperament and training, to have allowed himself less extravagance of extension than a mercantile entrepreneur.[66]

Assuming that the letter of credit acceptance method could be generally used, the quotation makes the mistake of overrating a credit instrument's powers. Will bankers issuing letters of credit instead of the usual loans, become through this change, far better judges of the "what and when" of overexpansion of credit, of speculation in merchandise, of "overbuying"?

Bankers are in business to make money. They must meet

[61] This does not apply to "discounting" risks.

[62] The generalization has decided weaknesses as hereinbefore noted.

[63] *Ibid.*, p. 8.

[64] Clearly this discussion does not include buyers who now discount bills and borrow from their banks.

[65] Hardly applies to companies selling a diversified line in wide markets or to concerns not importantly affected by the business cycle.

[66] Who is limited by "his" bank which may be well aware of the risks in lending to the seller or which may be financing his buying, processing, inventory, etc.

competition to hold "valued accounts." They face the same limitations in forecasting the future of an industry or of general business as do any other groups of business men and economists. They use methods of credit analysis which are yet in the infancy of their development. Thus bankers, like business men, can make mistakes; they can become too optimistic and too badly frightened.

And who, in the last analysis, carries the credit load now? Who, in the past, has financed business expansion through a period of "inflation," speculation and "overbuying," credit stringency? The banker, of course. The seller and his bank have carried the buyer or the buyer has borrowed to pay the seller. The producer, storer, shipper have borrowed from banks to finance their operations. The expansion of plant and working capital, security and commodity speculation have been financed in large part by bank credit.

Credit stringency was not the result of any given form of credit instrument. It resulted from all the forces[67] operating to produce a business cycle. Prior to 1913, the credit stringency of a period of liquidation found the banks as a whole with reserve ratios below fixed, legal, minimum requirements. Curtailment of bank credit forced drastic liquidation of stocks, losses, failures, suspension of specie payments, panics. Concerns which could obtain loans (renewals and emergency loans), could pay trade debts, refund open market paper and other bank loans that had to be paid. Safe loans were often unliquid for the time being and often unshiftable because of the inadequate lending power of the commercial banking system as a whole.

The Federal Reserve system, it is assumed, will at least eliminate panics[68] by keeping available a reservoir of free reserves to which, in times of credit stringency, member banks can shift safe but temporarily unliquid paper. The reserves obtained by these shifting activities can be used to support bank credits en-

[67] The "stresses and strains" produced by a period of cyclical price elevation are not solely due to credit stringency.

[68] Credit control to prevent "inflation" is not here considered. It may well be that perfection of credit control without any change in methods of financing would aid to "cure the evils" of inflation by prevention.

abling sound concerns to avoid the losses of too drastic a liquidation of goods, to meet pressing obligations, to finance such operations as are needed or seem desirable.

More general use of letters of credit and acceptances implies relaxing the present safeguards to their issue thus increasing the possibility of their use to finance "over buying," speculation, and so on.[69] To override the practices of decades will be difficult in the absence of a strong *a priori* case for the deviation. Abuses have crept into current bank acceptance practice even under the conservative restrictions of banking law and regulations. The consequences have not been, by and large, desirable.

Therefore, given our present methods of credit analysis and business forecasting, the general use of letters of credit would work small change in the sequence of affairs. Once a period of business expansion got under way, bank credit would respond as usual to the demands made on it and the volume of bank acceptances and deposits would increase. When the banking system's reserve ratios became "too low" and/or other events produced falling prices, slack demands and hence unliquid merchandise inventories and operating losses, stock mark-downs would occur. Buyers would be short of funds to pay acceptances because they could not sell to unemployed consumers or because retailers and wholesalers were "overstocked" or waiting for prices to "hit the bottom."

Failures would mount; frozen acceptances instead of "frozen loans" would occupy the attention of bankers, shifting of acceptances to Reserve Banks would be necessary. Falling prices and profits would bring still more failures, frozen assets, frozen acceptances, unemployment—the old round. Bankers would have to liquidate or reorganize concerns (buyers) unable to pay acceptances and insolvent or bankrupt (or both). A credit instrument does not cause a transaction to liquidate itself; nor make human judgment perfect; nor increase bank reserves.

The letter of credit could not, per se, make more effective the rediscount or open market controls of credit now available to Re-

[69] The "non-bankable" risks would still be carried by sellers for practical reasons.

serve Banks.[70] In the absence of any other improvements in credit control and practice, the letter of credit bank acceptance leaves us about where we are so far as prevention of inflation and attendant evils are concerned. In short, we now have the same means of at least attempting to control the flow of credit that we would have were acceptances under letters of credit to be generally used and subject to less conservative limits and principles than now prevail. Efforts to improve methods of gathering and analyzing credit data, to make forecasting methods more exact, to make business men and bankers budget-conscious, cycle-conscious are likely to be more productive of reduced credit risks and of business stability than efforts to secure general adoption of letters of credit and bank acceptances.

Table I indicates recent trends in the volume and uses of dollar bank acceptances, 1925–1928.

TABLE I

DOLLAR BANKERS' ACCEPTANCES OUTSTANDING

(In Millions of Dollars)

	September 30, 1925	September 30, 1928	Increase
Imports	283	321	38
Exports	205	370	165
Domestic	15	15	.....
Warehouse credits	74	99	25
Dollar exchange	16	28	12
Based on goods stored in or shipped between foreign countries	14	171	157
Total	607	1,004	397

Compared with September, 1925, the volume of acceptances has increased by nearly $400,000,000. The larger part of dollar acceptances as is shown by Table I, is used to finance imports and exports of commodities. Acceptances for domestic use are still in relatively small amount. A large increase in the three years has occurred in the volume of acceptances based on goods stored in or shipped between foreign countries.[71]

Of domestic bills, the larger part are based on goods held in warehouses and they are in many cases related to the export business and show the same

[70] It might be argued that a larger volume of acceptances would complicate Reserve Bank control of credit by open market operations.

[71] From the *Federal Reserve Bulletin*, November, 1928, pp. 735–36.

character of seasonal fluctuations as do acceptances based on imports and exports.[72]

The largest volume of import acceptances was used to finance imports of sugar, silk, coffee, hides and skins, wool, and rubber. Export acceptances were used chiefly for exporting cotton, grain and flour, lard and meat, and copper. Cotton acceptances alone represented nearly ½ of the total export acceptances, and grain acceptances accounted for 1/7 of the total. Cotton and grains were also the most important commodities upon which acceptances arising on domestic transactions were based, such acceptances being for the most part drawn for the purpose of financing the agricultural staples while they are stored in elevators and warehouses awaiting export, though some of the commodities so stored later go into domestic consumption.[73]

V. CONCLUSION

The more general use of the bank acceptance and of the letter of credit as one method of originating bank acceptances, is held back by many limitations. The Federal Reserve Act and regulations make the bank acceptance generally useful in financing exports and imports and in financing the marketing of basic raw materials. These rules and principles are not designed to lead to any very general use of the bank acceptance in domestic finance.

Variables such as the character of the bank loan requirements of business, of terms of purchase and sale, of shipment periods, of production periods are at work to limit the use of acceptances in domestic and, to some extent, in foreign trade financing. The variability of credit risks closely limits use of acceptances in both areas.

Attempts to seriously change domestic credit methods should give careful and definite consideration to the costs and consequences of the changes. The danger of overlooking the values of prevailing practices and of overstating the advantages of change is very great. Credit cannot be made generally "cheap" by increasing the supply of one kind of paper while decreasing that of other kinds. It is doubted that, even at present, the cost of bank acceptance financing in the specific case is always or even generally enough less than costs of financing by bank credit of other

[72] *Federal Reserve Bulletin*, March, 1925, pp. 181–82.

[73] *Ibid.*, August, 1925, p. 528. Cf. R. A. Clemen, *Is the Grain Trade Changing?* A pamphlet published by the Illinois Merchants Banks, Chicago, Illinois.

kinds to justify widespread use of the device. The value of a "local" banker's control of buyers' credits is easily overexaggerated. The buying and operating activities of "bankable" risks are now quite generally subject to the credit control of their banks.

More effective control of the flow of credit is a function of many variables. Credit instruments are a minor factor in the problem but methods and practices of credit analysis and business forecasting, of utilizing Federal Reserve powers designed to control credit are major factors.

S. P. MEECH

FINANCING THE MERCHANT SHIPPING INDUSTRY

THE merchant shipping industry as we now understand the term is one of the products of the industrial revolution. Prior to the nineteenth century the idea of a common carrier by water was practically unknown, and shipping was a direct appendage of commerce. The great trading companies which have left an indelible mark upon history and the rising merchants of Salem and Boston were alike in that they owned the ships by means of which their commercial operations in distant parts of the world were carried on. A merchant owned ships in order that he might transport his own wares, and it would have appeared incredible to that generation that a man should own a vessel for the purpose of running it as a common carrier in oceanic commerce. The problem of shipping finance did not therefore exist as distinct from the more general problem of financing trade and commerce.

This financial relationship between commerce and shipping still exists in a few cases, notably in the case of such large industrial concerns as the United States Steel Company and the Standard Oil Company, which have subsidiary shipping interests to facilitate the marketing of their products. A rather curious survival was also found before the war in the case of a substantial portion of British tramp tonnage, owing to the fact that by legal fiction an English vessel is considered to be divided into *sixty-four shares,* each of which must be held in the name of a single natural person. A majority of the shares—say thirty-three out of sixty-four—was usually held by the managing owners, and in addition to the dividends upon their holdings these managing owners generally received a commission of 2 per cent of the gross earnings of the vessel, thus assuring themselves a comfortable income. The minority stockholders, on the other hand, had to content themselves with more meager returns, and for this reason the minority stock was usually held by exporting manufacturers and shipping merchants who were vitally interested in low shipping rates because they wished to expand their overseas business.

Despite these exceptions to the general rule, merchant shipping grew rapidly during the last century and had established itself as an independent industry before 1850. This change cannot be said to have immediately called into being a technique of financial management which was different from that found in any other industry: on the contrary, shipping availed itself of all those sources from which capital was generally obtained, and even at the present time shipping finance differs only in degree and not in kind from the financial problems with which any other industry is confronted.

Generally speaking there are four major sources from which a shipping company can obtain funds for investment in fixed assets, viz., (*a*) the shipbuilder, (*b*) specialized financial institutions, (*c*) commercial banks, (*d*) the security market. No definite statement can be made as to the relative amounts of capital which the merchant shipping industry of the world obtains from each of these four sources, nor is it possible to state precisely the extent to which a given shipping company will make use of each of them. It can, however, be stated that the smaller shipping companies will tend to use the first two methods, while the last two are only open to those companies which are comparatively well established and known to possess a sound financial structure. Certain differences in method are also apparent between one country and another, but no adequate data are available to serve as the basis of a quantitative comparison. We must therefore content ourselves with qualitative analysis, and to this end it may be well to describe briefly the four methods that have been enumerated.

The financing of the prospective shipowner by the shipbuilder appears to have occurred most frequently in Germany and Great Britain, and in both of these countries it has proved very much less popular since 1920 than it was before the war. The financial arrangements made between the shipbuilder and his customer vary considerably in accordance with cyclical fluctuations in the shipping and shipbuilding industries,[1] but it was

[1] F. C. James, *Cyclical Fluctuations in the Shipping and Shipbuilding Industries.*

common for the builder to accept from 10 per cent to 50 per cent of the price of the vessel spread over the period of construction, allowing the remainder to be paid off by instalments during a period of from three to six years after launching. Many cases are to be found of shipbuilders constructing and delivering vessels costing from £25,000 to £40,000 against a deposit of between £4,000 and £6,000.[2]

In the majority of cases the ships were mortgaged to the builder for the duration of the credit, and it may be added that when the earnings from the vessels were insufficient to enable the shipowner to pay off the mortgage the builder was sometimes compelled to take possession of the ship and operate it himself until such time as a favorable market gave him the opportunity to dispose of it at a reasonable price. In many cases bills of exchange were drawn upon the owner by the builder for the amount of the instalments, and when the shipbuilder was not strong enough to finance the owner himself he might discount the bills in the money market. The latter practice was not regarded very favorably, however, because the market does not take kindly to long-term bills, and when the bills were drawn for short periods to facilitate the discounting of them, occasion might arise when a refusal to renew the bill would cause serious embarrassment to the shipowner. The discount market, therefore, was not a popular source of funds with either the owner or the builder, and in practice when a builder has not been strong enough to finance the owner he has left the latter to arrange his own financing. This fact, together with the rapid increase in the price of ships during the last quarter of a century, has tended to reduce considerably the amount of capital obtained by the shipping industry from this source.

In the continental Europe, particularly in Holland and Germany, the builder was relieved of the burden of financing the shipowner by the creation of specialized financial institutions, known generically as "ship mortgage banks." The ship mortgage bank, which may be defined as an institution organized to make loans against mortgages on insured vessels, obtaining its

[2] Cf. Lavington, *The English Capital Market*, pp. 116–17.

funds by the sale of bonds against the mortgages so acquired, had its origin in Holland in 1899. The success of this experiment led to the creation of similar institutions in Germany, Holland, Norway, Sweden, Denmark, and Belgium, but it is in the first two of these countries that the greatest development has been achieved.

The ship mortgage bank is generally incorporated, and in the first instance funds are obtained by the sale of the bank's own securities. Although the authorized capital under the charter of incorporation is invariably large, the amount of capital stock issued seldom amounts to more than a small part of this figure. As occasion requires additional issues of stock will be made, but in no case which has come to the notice of the author has the capital stock issued been equal or even nearly equal to the authorized capital. The greater part of the working capital of the bank is obtained by the sale of ship mortgage bonds, secured by mortgages on the vessels of those shipowners to whom loans have been made. The security behind these bonds is very high indeed since they are guaranteed by the bank and secured, first of all, by the credit standing of the borrowing shipowner and, second, by the mortgages. In some cases the security is further augmented by the bank's requiring the borrower to take out a life insurance policy on his own life for the full amount of the loan, naming the bank as beneficiary in the event of his death.[3] Moreover, in all cases the vessel itself is fully insured and when the loan is to run for any length of time, provision is made against depreciation of the value of the collateral by an arrangement requiring that the loan shall be gradually reduced by periodic repayments of a part of the principal.

In Germany the bank is permitted to issue such bonds to an amount not in excess of ten times its aggregate paid-in capital and reserves, while in Holland the limit is fifteen times. Customarily the bonds are of low denominations in order that they may appeal to large numbers of small investors, and there appears to have been little difficulty in marketing them at 4½ or 5 per cent. In some cases the banks themselves will actively

[3] Eisfeld, *Das Niederlandische Bankwesen*, I, 242.

participate in the market to steady and maintain the price, either buying or selling as the occasion demands.

Turning to the relationship between the shipowner and the bank, we find that the latter will not usually advance more than 60 per cent of the valuation of the ship, such valuation being determined by a special appraisal on the part of the ship mortgage bank. In case a shipowner wishes to finance the construction of new tonnage through the bank, he may be able to borrow 60 per cent of the purchase price under a mortgage on the new vessel, while the remaining 40 per cent would be secured by a mortgage on the rest of his fleet. In this case the whole purchase money might be obtained from the bank, but this would only be possible in cases in which the shipowner possessed several vessels. The duration of the loans varies considerably, and loans are negotiated for all periods from one to twenty years, although in the majority of cases the contracts run for either five or ten years, considerably more than two-thirds of the loans arranged since the war coming within one or other of these categories.

The rate of interest payable on the loan also varies somewhat. Rates as high as 8 to 10 per cent have been reported, but these are comparatively rare and the majority of the loans appear to be negotiated at rates between 5 per cent and 6 per cent per annum. Within these limits the rate varies with the condition of the market, and in some cases there are changes between one market and another, but it should be remarked that in some districts where the rate appears to be unduly low it will be found on closer examination that the banks charge a commission of not more than 1 per cent for "costs of administration"—a practice which clearly amounts to a disguised increase in the rate. In general it may be said that in both Holland and Germany the rate on ship mortgage loans tends to be approximately 1 per cent above the rate on Lombard loans, and this adjustment seldom varies.

Ship mortgage banks have concerned themselves very largely with the smaller shipping concerns: indeed, the extent to which their facilities have been made use of by the large marine

corporations is surprisingly small if we except the period from 1920 to 1923 in Germany when the whole financial situation became abnormal, owing to the dominating influence of the rapid depreciation of the currency. Their chief service to shipping lies in the fact that they have facilitated the raising of capital in the case of small shipowners, while relieving the shipbuilder of a financial burden which it was not his economic function to bear. Singularly enough, no specialized financial institutions of this type were found in Great Britain prior to the war, and even during recent years the only development along similar lines has been the incorporation of the Mercantile Marine Finance Corporation, with a capital of £1,000,000. This institution is organized exclusively for the purpose of financing the construction of vessels, particularly in the case of the small shipping concerns which are not sufficiently known to the public to be able to float issues of securities, but up to the present time little information is available as to the extent of its activities.

While there are no ship mortgage banks in the United States, a considerable amount of capital has been supplied to the shipping industry by savings banks under what is known as the "Great Lakes Plan." The system has been in operation for many years in some of the states bordering the Great Lakes, and has become so recognized a practice that legislation has been enacted by the states setting forth the terms and conditions under which savings banks may make loans to shipping companies. An excellent example of such legislation is to be found in the Michigan Ship Mortgage Law[4] which provides "that such mortgages shall be upon steel steamships of more than five thousand tons capacity; that by the terms of the mortgage at least 10 per cent of the total issue of bonds shall be retired annually, beginning within two years of the date of the bonds; that the mortgage liability against the property shall not exceed one-half its actual cost; that the trustee of the mortgage shall be required to protect the lien by attending to the recording thereof and by causing the property to be insured for an amount equal to the full insurable

[4] Act 262 P.A. 1905, as amended by Act 480 P.A. 1907.

value of the steamship, such insurance to be made with loss payable to the trustee and the policies deposited with it."

These provisions vary somewhat from one state to another but in all cases the underlying principles are the same. In addition to their own funds and to those deposited with them, the savings banks are permitted to obtain additional capital by the flotation of marine trust bonds to an amount not exceeding the value of the mortgages by which they are secured. These bonds are usually issued in a series, a definite portion maturing each year and being redeemed out of the instalments paid by the borrower on the loan. This scheme has proved eminently successful and since its inception it is stated that nearly two hundred million dollars worth of marine trust bonds have been issued without a single defalcation on any issue.

The lack of any specialized financial institutions may explain in part the extent to which the English commercial banks have supplied fixed capital to the shipping industry, but the explanation is only partial because the commercial banks of continental Europe (particularly in the case of Germany) have occasionally resorted to similar practices in the case of the larger shipping companies. In the London market credit is extended to the prospective shipowner to finance the construction or purchase of a vessel. Ordinarily, the amounts are advanced to cover the payments as they fall due under the building contract, and in some cases the credit may be embodied in bills of exchange although this is not necessarily the case.

The bank invariably demands a mortgage on the vessel—although as in the case of all collateral loans it is emphasized that the primary source of repayment is the business of the shipowner and not the ship as such. Moreover, the vessel must be fully insured with an underwriter approved by the bank, and throughout the duration of the loan the policies are held by the bank or by an approved broker. (The latter provision is due to the custom of the London market, whereby a shipowner pays his annual insurance premium in four quarterly instalments, and at law the broker has a lien on the policy for the unpaid portion of the premium.) In the case of a good customer the bank will advance

not more than two-thirds of the cost price of the vessel, but in the case of one of the "Big Five" the loan is granted on a tonnage basis. Thus, in the case of a vessel which is built at a cost of £15 per deadweight ton, the market price after launching would seldom have exceeded £10–12 per ton in recent years. In such a case the bank would advance not more than two-thirds of the market value of the ship, or about £6.6–8. This, however, is a precautionary measure which has been dictated by the depressed conditions in the shipbuilding and shipping industries. In normal times there would be little or no difference between the workings of the two plans.

Credits in the first instance are usually granted for six months or one year, and in theory the bank is at perfect liberty to refuse to renew them at the expiration of that period. While the banks will not admit any implied agreement to renew the credit, they state the average duration of the loan at approximately three years, and at the present time this figure is undoubtedly too low since loans running from six to seven years are not unusual, and in one case a ten-year credit was found.

Among the "Big Five" in England, Barclays Bank, the Midland Bank, and the National Provincial Bank are most interested in the shipping industry, but in all cases the interest of the banks in this type of business has decreased considerably since the war. No doubt this change is largely due to the unstable condition of the shipping industry, but it may also be due in part to a desire on the part of the banks to confine themselves more strictly to the business of supplying working capital to business.

There remains finally as the fourth and most important method of raising fixed capital for the shipping industry the public issue of securities. This method is common to all the maritime countries of Western Europe and to the United States —although in the case of the last the offer of bonds or debentures appears to meet with a more favorable reception than is the case with common stock. In the case of Great Britain the interest in shipping securities is so great that new issues are frequently oversubscribed, and in connection with a recent public offering of one million shares of one of the larger English shipping com-

panies, no less than 8,900 letters of regret over inability to allot the amount applied for had to be sent by the syndicate manager. The investing public to which such an offer is made is very large, and the holdings of shipping securities are so widely scattered that no less than 44,000 shareholders, with an average holding of £500 each, are inscribed on the registers of the five leading British companies.

Yet the total amount of capital raised in this manner is not large when compared with the total offerings of new securities on the London market, as Table I clearly shows.

TABLE I

SECURITY ISSUES IN THE UNITED KINGDOM
1919–25

YEAR	SHIPPING		ALL ISSUES	
	Amount of Issue, In Thousand Pounds	Percentage of Debt to Total Money Raised	Amount of Issue, In Thousand Pounds	Percentage of Debt to Total Money Raised
1919	8,668	12	219,973	10
1920	15,636	2	307,708	15
1921	6,652	80	90,101	48
1922	16,893	74	98,612	51
1923	4,550	90	90,467	51
1924	3,236	80	100,047	38
1925	7,337	96	132,313	36

During the seven-year period from 1919 to 1925 the shipping securities floated in the London market amounted in the aggregate to £62,972,000, of which £29,848,000, or 47.4 per cent, was in the form of stock, while £33,124,000, or 52.6 per cent, was composed of bonds, debentures, and notes. The type of security offered is, however, very largely dominated by cyclical influences, as is plainly evident from Table I. During a period of prosperity the flotation of capital stock is a comparatively easy process, as is evidenced by the fact that in 1920 only 2 per cent of the total offerings was composed of funded debt—while the conditions of depression necessitated the raising of more than 75 per cent of the required funds by means of debtor obligations. The financial structure of a shipping company is therefore apt to be influenced to a considerable extent by the condi-

tions of business at the time at which its securities are offered to the public, but this statement will be modified to the extent to which the financial policy of a shipping enterprise is definitely aimed at expansion during one particular phase of the cycle. Thus the editor of *Fairplay* points out[5] that it has long been the custom of the larger shipping companies to build up their fleets during a period of depression in anticipation of the approaching revival in business. To do this the company will normally borrow money on debentures, redeeming these out of the sums annually set aside for depreciation. The financial policies of the shipping industry are, however, outside the scope of this article and are only adverted to at this point as emphasizing the cyclical influence on the sale of shipping securities.

TABLE II

ESTIMATES OF THE TOTAL CAPITALIZATION OF THE BRITISH SHIPPING INDUSTRY IN MILLIONS OF POUNDS STERLING

	1913	1924
Cargo boat companies....	£97	£181
Liner companies.....	£59	£186

Similar studies of the shipping securities offered on the markets of other maritime nations would reveal a situation similar to that which exists in the United Kingdom, and for that reason the statistics have been omitted. The issue of securities represents by far the largest source of funds to which the merchant shipping industry resorts, and it seems highly probably that it will tend to increase in importance in the future. Taking the financial structure of those companies whose balance sheets are published in Fairplay's *Annual Summary of British Shipping Finance* as a basis, we obtain the interesting estimates given in Table II. The volume of securities outstanding has more than doubled during the intervening decade, and a study of shipping finance during that period tends to show that almost all the financial expansion of the British merchant shipping industry has been brought about by the sale of securities.

[5] *Fairplay*, CIV, 239.

When we turn to the question of working capital, there is much less complexity. In the case of almost all of the older well-established shipping companies, working capital is provided entirely by the reinvestment of earnings. Indeed, it is apparent from a study of the balance sheets of some of the largest companies that an appreciable proportion of their funds is invested in liquid assets of a non-maritime nature. This question, however, pertains to a study of financial policies rather than to a survey of the sources of shipping capitalization and we shall here confine ourselves to the methods by which a shipping company may obtain working capital—bearing in mind that the discussion applies mainly to the smaller companies.

Before the war the major sources of working capital was the specialized financial institutions, such as the ship mortgage banks of continental Europe and the marine investment trusts of the United Kingdom. These marine investment trusts are financial corporations organized for the dual purpose of acquiring a portfolio of diversified shipping securities and of loaning working capital to the shipowner against the security of a mortgage on his vessel. The capital of the trust is raised by the sale of preference or ordinary shares, and in the majority of cases the former, which carry no voting rights, account for the bulk of the capitalization. The number of these specialized institutions is not large, and in the case of some of the smaller ones they are subsidiaries of banking or shipping interests. One of the largest and best known among them is the British Steamship Investment Trust Limited, and a brief discussion of the operations of this company will be of use to us as a demonstration of recent tendencies within the field.

The trust was organized and incorporated in 1877 and in pre-war days the capital was practically all invested in shipping securities or ship mortgages. Owing, however, to the abnormal situation in the shipping industry during the war and post-war period, many of these securities were liquidated and it was deemed unwise to reinvest the proceeds in the shipping industry. The funds were therefore invested in other fields and in 1926, while the investments held by the trust amounted in the aggre-

gate to £3,311,343, shipping shares accounted for only £492,266 and shipping debentures for only £70,530 of this total. Approximately five-sixths of the total investments of the trust are therefore in fields other than shipping, and since 1919 the company has invested no money whatever in shipping mortgages.

Conditions in British shipping are, however, in a pronounced depression, which has lasted with minor fluctuations since 1920. In the case of the shipping securities held by the trust, the value at which they appear on the books is undoubtedly low, and this tends to exaggerate the importance of the other investments. When the shipping industry revives it is reasonable to assume that the maritime investment trusts will interest themselves to a much greater extent both in shipping securities and in ship mortgage loans, so that it is essential to include them in this survey as potential sources of working capital for the shipping industry.

In general, however, it would seem that the merchant shipping industry, like all other industries, tends to obtain the bulk of its working capital (in so far as it does not own an adequacy of liquid funds) from the commercial banking system. No special arrangements peculiar to this industry have been found to exist in any country, but the usual criteria of credit-granting are applied to the applications for credit of a shipowner in the same way that they apply to any other potential borrower. Such loans are generally unsecured, although in some cases the bank may demand a mortgage on the ship as collateral security.

Any study of the sources of capital for the shipping industry tends to emphasize in the mind of the student two important factors which are now at work. First, there seems to be a distinct tendency for the specialized institutions to decrease in importance, and, second, the financing of shipping appears to be dependent upon cyclical fluctuations to an unusual extent.

Within the shipping industry itself the process of concentration and amalgamation began toward the close of the last century, but it has progressed at a greatly increased rate during the last two decades. As a result of this development the typical unit in the industry tends to be the shipping line rather than the indi-

vidual ship, and a distinct diminution is apparent in the number of small shipping companies owning one or two vessels. These larger maritime units are in general both greater and stronger from a financial viewpoint; they are able to obtain the necessary funds from the capital market or from the commercial banks, and so are independent of the specialized financial institutions which were designed to meet the needs of the owner of one or two vessels, to whom few other sources of capital were available. Moreover, the specialized financial institutions are usually too small to meet the needs of a large shipping company: a fact which compels that company to dispense with their services.

The thought immediately presents itself that larger institutions of a specialized nature might be created to meet the needs of the shipping industry, but it is doubtful whether any economic need for this step exists. Owing to the rationalizing process, the large units in the merchant shipping industry today are no more dependent upon specialized financial institutions than is the United States Steel Corporation or the General Motors Company. There is no reason to assume that the financial problems of the Royal Mail Steam Packet Company differ in kind from those of any large industrial concern, and it would seem that to the extent that this development proceeds in the shipping industry the services of specialized financial institutions will be rendered unnecessary.

Regarding the problem of cyclical fluctuations, the author has presented elsewhere[6] a study of their influence. In the past the oscillations between prosperity and depression have been more violent in the allied industries of merchant shipping and shipbuilding than they have been in most other industries, and this fact has exercised a marked influence on shipping finance. With the growing economic integration of the world and the rationalizing process within the industries themselves, these fluctuations will tend to become less violent, but it is probable that the cycle will always need to be given a place in any scheme of financing for the merchant shipping industry.

F. CYRIL JAMES

[6] *Cyclical Fluctuations in the Shipping and Shipbuilding Industries.*

IN THIS ISSUE

LOANS to Brokers and Dealers for Account of Others" is by Ivan Wright, professor of economics at the University of Illinois. Calvin Crumbaker, author of "The Panama Canal and the West," is assistant professor of economics at the University of Montana, on leave, completing his work for the doctorate at the University of Wisconsin.

"Financing the Merchant Shipping Industry" is by F. Cyril James, assistant professor of finance in the Wharton School of Finance and Commerce of the University of Pennsylvania.

"The Bank Acceptance and Letter of Credit in Short-Term Finance" is by S. P. Meech, assistant professor of financial organization in the School of Commerce and Administration of the University of Chicago.

Richard M. Page, author of "On Supplanting the Industrial Fatigue Concept," is a teaching assistant in the School of Commerce and Administration of the University of Chicago.

NOTES

SURVEYS OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH

THE National Bureau of Economic Research, now entering its tenth year, plans to publish the results of four important investigations in 1929, according to a recent announcement. Most extensive of the group is the *Survey of Recent Economic Changes*, made for a sponsoring committee of which President Hoover is chairman. This report will be divided into twelve main sections. The fields, and those responsible for them, are:

Changes in the Standard of Living—Dr. Leo Wolman

Industry: Technical Development—Mr. L. P. Alford; Changes in New and Old Industries—Dean Dexter S. Kimball; The Construction Industry—Mr. John M. Gries; Changes in Physical Organization—Dr. Willard L. Thorp

Transportation: Railroads—Professor W. J. Cunningham; Shipping—Mr. E. S. Gregg

Marketing—Professor Melvin T. Copeland

Labor—Dr. Leo Wolman

Management—Mr. Henry S. Dennison

Agriculture—Dr. Edwin G. Nourse

Price Structure—Dr. Frederick C. Mills

Profits, Interest, and Wages—Dr. Morris A. Copeland

Foreign Markets and Loans—Professor J. Harvey Rogers

Effect of Money and Credit Conditions on Business—Professor O. M. W. Sprague and Dr. W. Randolph Burgess

Conclusion—Dr. Wesley C. Mitchell

Under the editorship of Professor Walter F. Willcox, and with the co-operation of the League of Nations International Labor Office Migration section, a study is being made of the "Growth and Distribution of the World's Population Since the Great Migrations."

The first volume, 1,086 pages of international migration statistics, has been collected by Dr. Imre Ferenczi of the Geneva office, and is now complete in page proof, awaiting its second revision.

The second volume will include chapters from twenty writers in twenty different countries, each analyzing the migration statistics of his country. Professor Willcox will contribute two chapters to this volume. The general survey is hailed as the "pioneer effort of recent times to estimate the growth of the world's population since the middle of the seventeenth century."

A revised report on the *National Income of the United States*, by Dr. Willford I. King, of the Bureau, has been practically completed. It will contain estimates as complete as possible on national income from 1909 to 1925, and preliminary estimates for 1926 to 1928. Dr. King's current estimates have been summarized and supplemented by Dr. Morris A. Copeland in one of the chapters of the *Survey of Recent Economic Changes*, referred to previously.

Following these three reports, Dr. Leo Wolman's first volume on "The American Labor Market" is looked for. Dr. Wolman has developed a number of new and interesting series and index numbers, such as series of full-time weekly earnings and derived hourly earnings, of wage differentials, and indexes of wages and of unemployment for persons on the payrolls. The bulk of the volume will be devoted to a discussion of wages in the manufacturing industries, in the coal industry, rail transportation, building trades and other trades-union rates of wages.

A survey of "Mechanization and the Restriction of Immigration," by Dr. Harry Jerome, also is expected to be completed in 1929. This study will include such topics as: "The Industrial Distribution of Unskilled and Foreign-Born Workers," "The Volume of Immigration During Restriction," "Economic Conditions During Restriction," "Types of Machines and of Labor-Saving Changes," "Changes in the Degree of Mechanization," "The Present Degree of Mechanization," "Characteristics of the Machine-Producing Industries," "Economics of Mechanization," "Factors Hastening," "Factors Retarding," "Effects."

The following selected industries will be covered: Materials Handling; Clay Products: Brick and Tile; Pottery; Iron and Steel; Foundries; Cottons and Other Textiles; Paper and Pulp; Building Construction; Highway Construction; Marine and Railway Terminals; Agriculture; Mining; Domestic and Personal Service; Glass; Other Manufacturing Industries.

OBJECTIVES OF ADVERTISING RESEARCH BUREAU OUTLINED

IMMEDIATE objectives in the program of the Bureau of Research and Education of the International Advertising Association, according to the revised plans, include the following:

1. To build and maintain a central file, which will show sources of information about advertising, current research activities, current educational activities, and current methods of co-ordinating advertising and selling;

2. To develop educational plans and materials for the use of advertising clubs by (*a*) setting educational objectives for the clubs, (*b*) planning educational activities appropriate for the clubs, and (*c*) preparing educational materials for the use of clubs;

3. To promote regional, national, and international meetings to (*a*) assist progress in advertising practice, research, and education, and (*b*) promote a better understanding of advertising on the part of businessmen and consumers;

4. To organize co-operative research, with these objectives for the current year: (*a*) to collect information about advertising as a business, and (*b*) to study methods of co-ordinating advertising and selling in our changing distributive system so that the net profit line can be held up; and

5. To publish bulletins and reports of these types: (*a*) technical bulletins, (*b*) educational bulletins for advertising men, business men, and/or consumers, and (*c*) research reports.

Possible results of the general program of the Bureau, of which the above material indicates the immediate objectives, are: co-ordination of research activities, and co-ordination of educational activities, with resulting economies and standards; increased knowledge of advertising; improved instruction in advertising; more productive and hence more profitable use of advertising; more intelligent attitude toward advertising in the business world and in the minds of the public; more intelligent attitude toward advertising on the part of the next generation of business men and consumers.

N. W. Barnes, associate professor of marketing at the School of Commerce and Administration of the University of Chicago, is secretary of the Bureau.

PLANS FOR SPRING CONVENTION OF AMERICAN MANAGEMENT ASSOCIATION

THE American Management Association will hold its annual spring convention at the Hotel Pennsylvania, New York, during the week of May 6. Subjects to be discussed are:

1. Consolidations and Mergers
2. Style in Relation to Budgeting
3. Price Fluctuations and Their Relation to Budgeting
4. Committees—Their Functions, Authorities, Value, Limitations, and Administration
5. The Reverberations of Industrial Research
6. The Comptroller—His Functions, Activities, and Relationships to the Line Organization
7. Training Older Employees for Continued Employment
8. The Capacity of Older Men to Learn
9. Pensions
10. Fashion, Style and Art in Industry

In addition, there will be the usual meetings of the Institute of Management, Financial Executives' Division, and the Office Executives' Division.

MAKE SURVEY OF RESEARCH IN LAW

WRITERS on business law will be interested in a survey to be published by the Institute for the Study of Law at Johns Hopkins University.

The survey, according to a recent announcement, is planned to include all studies and research in or related to law now in progress or completed in 1928. The term "research in law" is to be interpreted in its largest sense, so as to include all studies or investigations, large or small, with the aim of presenting a picture of the work of all groups whose studies are concerned directly or indirectly with law or the use of legal materials. It is believed that such a record will serve to make the studies available for a greater number, and will help prevent duplication and overlapping of work.

A questionnaire for the study has been sent to many organizations and individuals. Those not receiving the questionnaire, who are doing research which they believe should be included are requested by the Institute to write in about their work, and to suggest names of others whose work they believe should be included. The report is to be completed in June, hence early responses are sought.

ACTIVITIES OF THE BUREAU OF BUSINESS RESEARCH AT THE UNIVERSITY OF PITTSBURGH

WITH the realization that local economic and business conditions are of far greater significance to the individual normally than are general national conditions, the University of Pittsburgh School of Business Administration established a Bureau of Business Research for the analysis of the economic and business welfare of the Pittsburgh district. In the view of the Bureau's directorate, every city and contributory region needs an impartial clearing house of facts as well as a technical laboratory of analysis. Moreover, a university should be able to make important contributions toward a science of business management corresponding to the technical standards in mechanical production.

Through participation in the analysis of business conditions, the student not alone prepares himself for more competent management, but derives, as well, an insight into the specific problems of the region from which he comes and to which he is likely to devote his future.

Based upon these considerations, the purposes of the Pittsburgh Bureau of Business Research, as recently formulated, are as follows:

1. To collect and analyze economic and business data indicative of changing conditions in western Pennsylvania.

2. To publish from time to time the results of original studies in business problems which promise to be of benefit to the business community of Pittsburgh.

3. To co-operate with business firms and associations in the analysis of their business problems.

4. To co-operate in research projects undertaken in departments of the School of Business Administration.

5. To train students of mature interest in the technique of business research.

Data covering an extensive field are available in the files of the Bureau for the use of the faculty for teaching material, public addresses and individual research, and to the general public. Special studies are undertaken for business firms or trade associations through private financing. Such studies are made generally available only with the consent of the firm.

Publication of the Bureau's studies takes two forms: a bulletin recording one or several analyses; and a less formal release as news or feature items for local newspapers or general publication. A periodical is planned, but it has not yet appeared appropriate to launch such a project.

The following analyses have been published as special studies:

Business Forecasting (a summary of current methods)

Housing Rents in Pittsburgh (an analysis of rent tendencies in various sections of the city and comparison with other living costs and other cities)

Residence Construction in Pittsburgh

Pig Iron Production

The Price of Pig Iron

Changes in Pittsburgh's Business Conditions (a study of department-store trade, life-insurance sales, commercial electricity consumption, building and real estate activity, bank clearings and debits, and new incorporations)

The present research program at Pittsburgh includes a study of retail practices and consumer preferences in the meat industry. Various neighborhoods, varying in rent levels, race, nationality, sect, and population have been chosen with meat retail outlets as nucleii. Physical aspects of the neighborhood are studied with reference to such items as transportation, topography, competing trade areas, and the proportions of various types of residences, construction tendencies, and the pressure of external economic and social forces. The retail meat stores are under analysis with regard to their independence or connection with a chain, their size and quantity of business, their advertising, severity of competition, service, and similar factors.

Consumer shopping habits and their food and patronage preferences are also under investigation. This includes variations in the prices of foods, and food substitutions as individual prices change. There are available several hundred budgets of low-income families, showing changes in consumption for the last three years.

The staff of the Bureau of Business Research consists of Professor John H. Cover, director; Mr. H. S. Davis, research assistant; Emmett H. Welch, graduate assistant; Mrs. Marion Rubins Davis, special research assistant; Russell A. Schell, Herman H. Kodisch, Henry Tuthill, research fellows; Mrs. Gladys M. Gardner, secretary.

BUSINESS RESEARCH AT INDIANA UNIVERSITY

TO AN immeasurable degree the efficiency and progress of industry have been accelerated in recent years by the contributions made by scientific and industrial research. The continued industrial leadership of the United States depends upon the quick application of scientific methods based upon unremitting research. The confidence of the business world in the efficacy of research is evidenced by the fact that private business enterprises are expending annually approximately $200,000,000 on research.

The amazing results of industrial research have served as a challenge to business to apply scientific methods of study to distribution, finance, advertising, etc., to the ends that wastes in distribution may be eliminated and that factual bases for sound business policies may be determined. The realization on the part of business men of the need for research has offered an opportunity to the collegiate schools of business, and in fact has imposed a responsibility upon them, to contribute toward the attainment of greater business and social efficiency by conducting organized and independent investigations, by trying to improve the methods of research, and by developing in students the ability to analyze business data and to draw sound conclusions.

Moreover, there seems to be a special obligation resting upon schools of business in state universities to participate in business research. The large business unit is able to maintain its own investigating department. But it is evident that the small business man cannot do this because of the large expense involved. The needs and problems of the "average business man in the typical business in an ordinary community" deserve more consideration than they have had in the past. A university bureau of business research is in a position to investigate matters of importance to the small business man and make the results of the study available to all who are interested.

Motivated by such considerations the School of Commerce and Finance of Indiana University made a modest beginning in this field of endeavor by establishing a Bureau of Business Research in September, 1925. The specific objectives in mind at the time of creating the Bureau may be summarized as follows:

1. To make general studies of the business conditions in Indiana
2. To earn the good will and co-operation of the business men of the state by helping them in the solution of their specific problems

3. To assist chambers of commerce by collecting facts bearing upon commercial conditions in the state

4. To gather information for the use of the state legislature

5. To gather material which might be used by teachers and students for the studying of the actual conduct of business

6. To train students in scientific methods of research—to create the proper attitude of mind, to arouse an eagerness to analyze the elements of a problem, and to teach them the way to attack a specific problem

Financial limitations have restricted the activities of the Bureau, but some progress has been made. A continuous study of the monthly conditions of business in Indiana is being conducted. The results of this study are published regularly in the *Indiana Business Review* through the courtesy of the Fletcher American National Bank of Indianapolis. This review has wide circulation among the bankers and the leading manufacturers and merchants of Indiana. The following special studies have been completed: "Wealth of Indiana" (1925); "Diversification of Industry in Indiana" (1925); "Income in Indiana" (1926); "State Income Taxation" (1926); "Transportation in Indiana" (1926); "Manufacturers in Indiana" (1926); "Mineral Resources in Indiana" (1926); "Year-End Surveys of Business Progress" (1925–1928); "Expenditures for Universities in Indiana and Other States" (1927); "Operating Results of Wholesale Grocers in Indiana, 1927" (1928); "State Excise Taxes" (1928); "State Excise Taxes on Corporations" (1929).

The following special studies are now in progress: "Foreign Trade of Indiana" (to be completed in May, 1929), "Co-operation in the Hardware Business" (to be completed in August, 1929), "The Tax System in Indiana," "Measures of Indiana Business Activity" (June, 1929), "Industrial Growth of Indiana" (October, 1929), "Operating Results of Indiana Wholesale Grocers in 1928" (June, 1929).

In addition to the formal studies under the direction of the Bureau of Business Research the following research studies have been conducted within the past few years by members of the staff: Public Expenditures and Taxation in Indiana (1924), by William A. Rawles; Britain's Economic Problems (1925), by J. E. Moffat; Readers' Guide to Management Literature (1925), by E. V. McCollough; Gold Production and Prices (1928), by L. D. Edie; Installment Selling, A Boon or Menace (1926), by J. E. Moffat; Causes of Bank Failures (1926), by F. V. Chew; The Guarantee of Bank Deposits

(1926–27), by C. E. Johnston; The Future of Hardware Retailing (1927), by C. W. Barker; Development of the High School Commercial Curriculum and University Courses (1928), by A. L. Prickett; Study of the Business of the Funeral Director with Particular Reference to Costs and Management (1928), by A. L. Prickett; Nationalism and Economic Theory (1928), by J. E. Moffat; Fixed Capital Records—Their Forms and Uses (in progress), by A. L. Prickett; and Analysis of Transportation Operating Costs (in progress), by G. W. Starr.

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BOOK REVIEWS

An Analysis of Bank Statistics for the United States. By ALLYN A. YOUNG. Cambridge: Harvard University Press, 1928. Pp. viii+78. Reprinted from the *Review of Economic Statistics.*

The announced purpose of this study is "merely to put some of the more important figures in the Comptroller's Reports into such shape as to make them useful to students of present day banking problems and in particular to students of the interrelations of the fluctuations of credit and of business activities." Although Professor Young insists that "there is little or none of the interpretive analysis which the figures obviously invite," nevertheless he has in fact quite freely suggested inferences to account for the data under survey.

One of the most interesting manifestations of this procedure is a series of inferences all of which relate to the significance of "money in circulation, not in banks." A few illustrations of these inferences may be cited. First, seasonal fluctuations in money in circulation, not in banks, reflect changes in retail trade rather than in labor pay roll, changes in the amount of money consumers spend rather than in the amount they receive, changes in the amount of money in merchants' tills rather than in the amount in peoples' pockets (p. 15). Second, "The fluctuations of the amount of money in circulation show a remarkably close resemblance to the cyclical fluctuations of wholesale prices during this period [i.e., 1901–14]. They generally lag behind the price fluctuations, by an interval that is often as much as half a year" (p. 24). Third, "The amount of lawful money held by banks depended [i.e., 1901–14] upon the general movement of money into and out of circulation" (p. 24). Fourth, Professor Young formulates a summary of the important rôle of the flow of money from circulation to the banks and back again. His concise statement of this matter follows the classical pattern introduced by Alfred Marshall in his famous testimony before the Gold and Silver Commission of 1887 (Questions 9627–52), but goes far beyond Marshall's statement in quantitative definiteness. One phase of the conclusions reached is as follows: "While the expansion of loans and discounts in New York was, in

considerable part, brought about by the accumulation of money in New York banks, the expansion of the loans and discounts of the outside banks reflects the growth of business activity. Money flows back to the interior, we might say, because loans and discounts have expanded there. Loans and discounts expand in New York because money has flowed there" (p. 29).

In addition to such reluctant but highly suggestive interpretive glances, the study is of value as a source of original financial data of national banks. Ample tables afford readily accessible records from 1867 to 1926. Unfortunately, the records exist only for call dates rather than for individual months. This limitation impairs the use of data for seasonal and cyclical analysis. For most series the gap can be filled for recent years by use of monthly reports of member banks, but such reports have not been included in the present study.

Much emphasis is directed upon regional differences in seasonal and cyclical fluctuations of credit and currency. The chief regional comparison is between New York City and the country outside New York City. The results of such comparison "suggest doubts respecting the adequacy and significance of any generalizations about the characteristics of the behavior of bank credit in which the distinction between the banks in a country's central money market and the country's other banks is not taken into account." One specific conclusion from the data for 1901–14 is, "The major cyclical fluctuations, both of loans and discounts, in the New York banks and in the outside banks, taken as a whole, are not synchronized, but come fairly close to being inversely correlated." However, many phases of regional financial behavior have been modified by the Federal Reserve system, and some of the sequences which prevailed before 1914 no longer exist. Some of these modifications are briefly described, but in general this phase of the problem is not pursued as far as one would like. The reader will remain puzzled to know to what extent the findings for the pre-1914 era retain significance under present conditions.

It is of some interest that Professor Young compares sequences, directions, and amplitudes of movement of scores of financial series without once appealing to coefficients of correlation. Hypothesis after hypothesis is set up or demolished as the case may be by direct inspection of charts and curves. Statistical methodology and fact accumulation are very definitely subordinated to verification or disproof of old theories, original suggestion of new theories, significant generalization, and penetrating analysis.

LIONEL D. EDIE

Currency and Prices in India. By C. N. VAKIL and S. K. MURANJAN. Bombay: D. B. Taraporevala Sons & Co.; London: P. S. King & Co. Ltd., 1927. Pp. xvi+549. 18*s*.

This addition to the many recent works on Indian finance and currency problems is divided into three parts: the first and last, dealing, respectively, with the monetary history of India and recent proposals for monetary reform, are the work of Mr. Vakil, and the second, a historical study of Indian prices, is a revised and edited version of Mr. Muranjan's M.A. thesis.

Tracing the monetary history of India from early times, Mr. Vakil attempts to show how Britain injured India by denying her a gold standard. Internal evidences of bias are not lacking. For example, in estimating the increase in the Indian tax burden attributable to the fall in the sterling price of the rupee from 1875 to 1898, the author makes no allowance for the rise in rupee incomes, and this in spite of the fact, which he states in a subsequent section, that internal depreciation proceeded almost as rapidly as the fall in the rate of exchange, a fact which he uses to show that the alleged benefit of falling exchange to Indian exporters was negligible.

The author contends that the pre-war standard in India was not a true gold standard, since the government, legally bound to give rupees for sterling at a fixed rate, was not similarly compelled to give sterling for rupees. Later he notes that the government established the custom of selling reverse councils in sterling and actually kept the exchange fluctuations within narrow limits. From this fact he concludes, not that an effective gold exchange standard was maintained, but that internal price stability was sacrificed to stability of the exchange rate. He does not show how a "true" gold exchange standard would have had a different effect.

Like Messrs. Wadia and Joshi,[1] and in opposition to Mr. Keynes,[2] Mr. Vakil contends that the adjustment of the volume of money during this period was not automatic. He repeatedly states that the government arbitrarily "forced" rupees into circulation in large amounts; but he neither attempts to prove his contention nor gives a detailed account of the mechanism by which the inflation was effected. In Part II, however, Mr. Muranjan attempts a statistical demonstration. The latter shows that in five cases out of eight heavy coinage of

[1] *Money and the Money Market in India,* Macmillan, 1926.

[2] *Indian Currency and Finance,* Macmillan, 1913.

rupees was followed three years later by large increases in the rupee circulation, though in these years the commodity balance of trade was not unusually favorable. Since the government could not predict changes in the currency requirements of the country so far in advance, he concludes that it followed the practice of arbitrarily coining rupees in large quantities and forcing them into circulation three years later. This type of reasoning requires no comment.

In general, the history of Indian currency presented in this part is more detailed, but more controversial, less clearly presented, and less effectively organized than other studies recently published on the same subject.[3]

In Part III, Mr. Vakil's subject matter is better suited to his controversial abilities. Here he discusses recent proposals for the reform of Indian currency and banking and gives special attention to the report of the recent currency commission. For the most part he approves of the commission's recommendations, but he urges most emphatically that the gold reserves be kept entirely in India. Since gold plays but a minor rôle in the domestic circulation, and cannot be used effectively in India to support the exchange, it is somewhat difficult for the western mind to understand the reason for this emphasis.

Mr. Muranjan's study of Indian prices in Part II presents the results of much laborious and useful research. He separates sharply the factors affecting relative prices from those affecting the general price level, and interprets in detail changes in the prices of twenty-two important commodities. His discussion of changes in the general price level necessarily involves a repetition of material already presented in Part I. Where his interpretation differs from that of Mr. Vakil, qualifications are introduced in footnotes to bring the two views into harmony. Much detailed statistical material is presented. Unfortunately many defects of printing or proofreading appear in this as in other parts of the work. Mutilated words and obviously misplaced decimal points suggest the presence of other inaccuracies in the statistical data.

Despite the defects exemplified above, the book contains much useful material, and is interesting in that it presents a point of view possibly held by an important portion of the Indian public.

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[3] Cf., e.g., G. Findlay Shirras, *Indian Finance and Banking*, Macmillan, 1920.

The Reserve Banks and the Money Market. By W. RANDOLPH BURGESS. New York: Harpers, 1927. Pp. xxi+1328.

This work reaches a high standard of excellence as a clear and simple description of the operations of the Federal Reserve institutions. The context is illustrated by numerous charts and tables. There is relatively little of banking theory although much is implied. The rare quality of the treatment lies in its lucid presentation to the man on the street of many complex and technical processes of central banks.

Although the author has obviously striven for genuine objectivity, nevertheless one gains the impression that certain preconceptions have asserted themselves rather strongly in the picture. One wonders to what extent this description of reserve bank procedure is a defense reaction against efforts to hold the reserve banks responsible for price stabilization. Those phases of bank policy are emphasized which would predispose the reader against central bank control of the price level.

In certain cases where opinion is allowed to color description, inconsistency blurs the account. For instance, after stressing the extreme local autonomy of reserve banks and the right of "home rule" in determination of policy, the author in a brief footnote mentions the forced raising of the Chicago Bank's discount rate in 1927. Again, after emphasizing the utter inability of a "reserve bank to dictate how its credit shall be put to employment," the author intimates that in 1926 credit restriction was desirable because of the danger that funds would be employed in speculation.

Running through the entire book, there appears an interesting reliance upon the concept of "the needs of business" as a guide to all phases of bank policy. The non-gold security for Federal Reserve notes is approved because it "increases and decreases with the agricultural and business needs of the country" (p. 44). "Whenever currency in circulation becomes larger than is required by the needs of business, it begins to return to the banks" (p. 48). In discussing "The Mechanism of Credit Policy," the writer states: "The problem is to set up the mechanism in such fashion that reserve funds will be used as fully as necessary to provide business with adequate funds" (p. 168). Relative to "Credit Policy," the view is expressed, "Broadly speaking, the aim of Federal Reserve credit policy is to help bring about such an adaptation of the volume of credit to the volume of business that every legitimate need for credit will be met, but that the

volume of credit will not be expanded beyond the legitimate need" (p. 179). A brief reference to indexes which may throw some light on "legitimate need" is given, but this reference painstakingly minimizes the significance of commodity prices as an indicator of "need" (p. 199). It is observed that, "To the extent that the Reserve System exercises an influence upon social welfare in this country it does so by insuring a supply of credit adapted to the needs of the people. And interest rates are perhaps the best available measure of the adaptation of the credit supply to the country's needs" (p. 276). It is unnecessary to multiply illustrations. The ready resort to vague concepts of "the needs of business" leaves the critical reader puzzled as to what after all Reserve Bank officials mean by such concepts. Have they been thought through and concretely defined?

The strongest portion of the book is the analysis of secondary expansion under the Federal Reserve System. Both monetary theorists and practical bankers will gain much from a painstaking reading of Burgess' penetrating account of secondary expansion.

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